

APPLICATION MANUAL FOR THE WIND ENERGY TARGET SOLICITATION

*“EXPANDED WIND REGIME TURBINE TECHNOLOGY
AND INTERMITTENCY MANAGEMENT
DEMONSTRATION”*

MANUAL

July 2004



Arnold Schwarzenegger, Governor

CALIFORNIA ENERGY COMMISSION

Dora Yen-Nakafuji
Principal Author

Jesse Rosales
Solicitation Administrator

Dora Yen-Nakafuji
Michael Kane
Wind Energy Program
**RESEARCH AND
DEVELOPMENT OFFICE**

George Simons
Program Manager
**RESEARCH AND
DEVELOPMENT OFFICE**

Ron Kukulka
PIER Program Director
**TECHNOLOGY SYSTEMS
DIVISION**

Marwan Masri
Deputy Director
**TECHNOLOGY SYSTEMS
DIVISION**

Robert L. Therkelsen
Executive Director

Your comments and suggestions for improving this Application Manual for the Wind Energy Target Solicitation are welcomed. Should you have any questions or comments about the materials, write or call:

CALIFORNIA ENERGY COMMISSION
Research and Development Office
Wind Energy Program
1516 Ninth Street, MS-43
Sacramento, CA 95814-5512

Tel: 916-654-5129
Fax: 916-653-6010

Table of Contents

I. INTRODUCTION	3
<i>HOW IS THIS SOLICITATION ORGANIZED?</i>	<i>3</i>
II. GENERAL OVERVIEW	3
<i>WHAT IS THE GENERAL OVERVIEW OF THIS SOLICITATION?</i>	<i>3</i>
III. QUESTIONS ABOUT THE WIND TARGETED SOLICITATION FOR EXPANDED WIND REGIME TURBINE TECHNOLOGY & INTERMITTENCY MANAGEMENT CAPABILITY DEMONSTRATION	5
<i>WHAT IS THE SCHEDULE?</i>	<i>5</i>
A. QUESTIONS RELATED TO WIND/PIER RENEWABLES ENERGY PROGRAM AREA	6
A1. <i>WHAT IS THE PIER PROGRAM AND HOW IS IT RELATED TO THIS WIND TARGETED SOLICITATION?</i>	<i>6</i>
A2. <i>WHAT ARE PIER PROGRAM AREAS?</i>	<i>6</i>
A3. <i>WHAT IS THE PURPOSE OF THIS WIND TARGETED SOLICITATION?</i>	<i>7</i>
A4. <i>WHY TARGET EXPANDED WIND RESOURCES AND IMC FOR ELECTRICITY GENERATION?</i>	<i>8</i>
A5. <i>WHAT IS THE SCOPE OF ACCEPTABLE PROJECTS?</i>	<i>9</i>
A6. <i>WHAT ARE THE TARGETS AND STRETCH GOALS FOR THIS SOLICITATION?</i>	<i>11</i>
A7. <i>HOW MUCH FINANCIAL ASSISTANCE IS AVAILABLE?</i>	<i>12</i>
A8. <i>WHAT ARE THE MATCH FUNDING REQUIREMENTS?</i>	<i>12</i>
A9. <i>WILL THIS AWARD BE A GRANT, LOAN OR CONTRACT?</i>	<i>13</i>
A10. <i>HOW AND WHEN WILL FUNDS BE DISTRIBUTED?</i>	<i>13</i>
A11. <i>HOW DO I APPLY AND WHAT IS THE PROCESS?</i>	<i>13</i>
A12. <i>WHO CAN APPLY TO THIS SOLICITATION?</i>	<i>13</i>
A13. <i>WILL THERE BE OPPORTUNITY TO MEET WITH THE ENERGY COMMISSION ABOUT THIS SOLICITATION?</i>	<i>14</i>
A14. <i>HOW DO I ASK QUESTIONS ABOUT THIS SOLICITATION?</i>	<i>15</i>
A15. <i>WHO DO I CONTACT FOR INFORMATION REGARDING THIS SOLICITATION?</i>	<i>15</i>
B. QUESTIONS RELATED TO PROPOSAL FORMAT AND REQUIRED DOCUMENTS.....	16
B1. <i>IS THERE A LIMITATION IN THE PROPOSAL FORMAT AND LENGTH?</i>	<i>16</i>
B2. <i>WHAT IS THE REQUIRED FORMAT FOR A PROPOSAL?</i>	<i>16</i>
B3. <i>WHAT IS REQUIRED IN VOLUME 1 - ADMINISTRATIVE INFORMATION?</i>	<i>17</i>
B4. <i>WHAT IS REQUIRED IN VOLUME 2 – TECHNICAL AND COST INFORMATION?</i>	<i>19</i>
Section 1. Scientific and Technological Baseline	22
Section 2. Problem Statement	22
Section 3. Project Goals and Objectives	23
Section 4. Technical Approach and Probability of Success.....	25
Section 5. Market-Connected Benefits of Successful Completion of the Project.....	26
Section 6. Work Statement, Products, Due Dates and Gantt Chart	28
Section 7. Project Costs.....	31
B5. <i>WHAT CAN I PUT IN VOLUME 3 – CONFIDENTIAL INFORMATION AND PRE-EXISTING INTELLECTUAL PROPERTY?</i>	<i>33</i>

<i>B6. WHAT TYPES OF INFORMATION ARE CONSIDERED CONFIDENTIAL?</i>	33
<i>B7. HOW IS CONFIDENTIAL INFORMATION TREATED?</i>	34
C. QUESTIONS RELATED TO EVALUATION PROCESS AND SCORING CRITERIA	35
<i>C1. WHAT IS THE PROPOSAL SCREENING PROCESS?</i>	35
1. <i>Administrative Screening</i>	35
2. <i>Completeness Screening</i>	36
3. <i>Eligibility Screening</i>	36
4. <i>Feasibility Screening</i>	36
<i>C2. HOW WILL PROPOSALS BE SCORED?</i>	37
<i>C3. WHAT ARE THE TECHNICAL, FINANCIAL AND POLICY EVALUATION CRITERIA?</i>	38
D. QUESTIONS RELATED TO SUBMISSION OF APPLICATIONS AND ADMINISTRATIVE INFORMATION	44
<i>D1. IS THERE A DEADLINE FOR SUBMITTING A PROPOSAL TO THIS SOLICITATION?</i>	44
<i>D2. HOW SHOULD A PROPOSAL BE PACKAGED AND LABELED FOR SUBMITTAL?</i>	44
<i>D3. IS THERE A PREFERRED METHOD FOR DELIVERY OF THE PROPOSAL?</i>	44
<i>D4. WHAT IS THE ADDRESS FOR DELIVERY OF PROPOSALS?</i>	45
<i>D5. CAN I BE REIMBURSED FOR THE COST OF PREPARING THIS APPLICATION?</i>	45
<i>D6. CAN THE ENERGY COMMISSION IMPOSE CONDITIONS OR LIMITS ON AWARDS?</i>	45
<i>D7. CAN THE ENERGY COMMISSION CANCEL OR AMEND THIS SOLICITATION?</i>	45
<i>D8. HOW WILL I KNOW IF THE SOLICITATION IS REVISED?</i>	45
<i>D9. WHAT IF I FIND AN ERROR IN THIS SOLICITATION DOCUMENT?</i>	46
<i>D10. GENERALLY, WHAT ARE THE GRANTS REQUIREMENTS?</i>	46
<i>D11. WHAT IF I DECIDE TO MODIFY OR WITHDRAW MY PROPOSAL?</i>	47
<i>D12. HOW WILL I KNOW IF I HAVE BEEN AWARDED A GRANT?</i>	48
<i>D13. WHAT IS THE GRANT AGREEMENT PROCESS?</i>	48
<i>D14. WHAT ARE THE GROUNDS FOR REJECTION?</i>	48
<i>D15. WHAT HAPPENS IF MY PROPOSAL IS UNSUCCESSFUL?</i>	48
<i>D16. WHAT HAPPENS TO MY PROPOSAL DOCUMENTS?</i>	48
IV. KEY WORDS AND THEIR DEFINITIONS	49
V. APPLICATION MANUAL ATTACHMENTS AND FORMS AND EXHIBITS	54

I. Introduction

How is this Solicitation Organized?

This Wind Targeted Solicitation for *Expanded Wind Regime Turbine Technology and Intermittency Management Capability Demonstration* is organized into the following sections:

- Section I. Introduction
- Section II. General Overview
- Section III. Questions about the Wind Targeted Solicitation for Expanded Wind Regime Turbine Technology and Intermittency Management Capability (IMC) Demonstration
 - A. *Questions Related to Wind Energy/PIER Renewables Energy Program Area*
 - B. *Questions Related to Proposal Format and Required Documents*
 - C. *Questions Related to Evaluation Process and Scoring Criteria*
 - D. *Questions Related to Submission of Applications*
- Section IV. Key Words and Definitions
- Section V. Application Manual Attachments and Forms

II. General Overview

What is the General Overview of this Solicitation?

The overall purpose of this targeted wind Solicitation is to help achieve the state's Renewable Portfolio Standard (RPS) goals by accelerating development of California's wind resources. Enacted in 2002, the California RPS requires retail sellers of electricity to purchase 20% of their electricity procurements from renewable resources by no later than 2017. In the Energy Commission's Energy Action Plan, this goal has been accelerated to 20% by 2010. Given the rapid development and deployment of wind projects and the state's abundant supply of wind resources, wind generated electricity is perceived as a major contributor to the accelerated RPS goals. However, to meet the state's RPS goals, new turbine technologies are required that can cost-effectively harness the wind from a variety of speed regimes and accommodate for the intermittent nature of wind. This Targeted Wind Energy Solicitation will demonstrate turbine systems capable of operating in an expanded low speed wind regime as well as illustrate intermittency management strategies and systems that will firm up wind generated electricity and better enable wind energy systems to cost-effectively provide electricity. This Solicitation will provide funding to support new and innovative technologies demonstrated on a complete turbine system that can help accelerate development in the state's low speed wind resource regimes (Class 3 wind speeds measured at 10 meters above the ground).

Traditionally, wind developments focused on windy areas with speeds averaging 13 miles per hour. Designated as Class 5 and above in the 1980s, these areas were considered to be the most

economical and feasible for harnessing wind power based on turbine technology of the time. Over the decades, improvements in turbine component manufacturing, power electronics and aerodynamics have improved their overall performance, increased market competitiveness by reducing the cost of energy (COE) and expanded markets from onshore to offshore applications. These improvements are also making moderate and lower speed wind regimes (Class 3 and 4) more economically viable. Wind resource assessments conducted for the Energy Commission show there are significantly more low speed wind regimes in the state than high speed wind. Lower speed wind regimes tend to also be closer to electricity demand centers. Increasing development in low speed wind regimes will help locate generation resources closer to demand centers and point of use locations. In addition, coupling wind resources with firming options will enhance the value of wind-generated electricity and can help make it a dispatchable commodity. Benefits to California ratepayers include more affordable, diverse, reliable, environmentally preferred and safe electricity using in-state renewable resources.

This is a targeted, performance-based Solicitation and only those candidates who meet the selection and minimum scoring criteria stipulated in the Application Manual will be considered for funding. The primary project focus is on demonstration of a complete wind turbine system and coupling with a deployable intermittency management capability (IMC) that relies on commercially available generation/storage technologies. Only complete wind turbine system technologies will be considered for this demonstration project. Additionally, project funds are not to be expended on research or development of any coupled hybrid generation/storage technologies. Incremental advances and component development must be integrated into a complete wind turbine system. Considerations must also be made to include firming options that meet minimal performance criteria as specified in the application manual. Firming options may include the selection of the best storage option, hybrid technology, power purchase or other alternatives but must be tailored for integrated operation with the wind generation resource at the particular site.

The Public Interest Energy Research (PIER) Program under the Renewable Energy Subject Area will provide up to \$5 million of funding for this targeted Solicitation to research, develop and demonstrate (RD&D) expanded wind regime technologies coupled with intermittency management options. A single proposal may request no more than \$1.75 million in PIER funding.

Wind turbine manufacturers and technology developers with a demonstrated commercialization capability are targeted under this Solicitation. It is the responsibility of the Applicant to organize and manage a minimum recommended RD&D team that include technology developers, utility integrators and intermittency management developers to fulfill the Solicitation objectives. Additionally, teams of subcontractors may include any or all of the following: RD&D organizations in turbine technologies, RD&D organizations dealing with storage devices/systems, individuals, businesses, land and farm owners, developers, utilities/municipal utilities and public or private research institutions.

Administered by the Energy Commission, the PIER program funds certain public interest energy RD&D efforts that will advance energy science and technology and benefit California ratepayers in a way not adequately provided by the competitive and regulated energy markets. PIER's

mission is to conduct public interest energy RD&D that improves the quality of life for Californians by providing environmentally sound, safe, reliable and affordable energy services and products. Detailed information about the PIER program can be found on the Energy Commission website at <http://www.energy.ca.gov/research>.

III. Questions about the Wind Targeted Solicitation for Expanded Wind Regime Turbine Technology & Intermittency Management Capability Demonstration

The following questions and answers should provide prospective Applicants with valuable information about this RD&D effort and the application process. All Applicants are strongly encouraged to submit any questions about this Solicitation to the Energy Commission's Research and Development Office, and to attend the pre-proposal conference noted below.

What is the Schedule?

Schedule of application, award, and project start dates.

Pre-Proposal Conference Hearing Room B, California Energy Commission 1516 Ninth St, Sacramento, CA 95814	<i>Estimated</i> August 12, 2004 1:00 p.m. to 3:30 p.m.
Post Question and Answers from Pre-Proposal Conferences (See Energy Commission's Web Site)	<i>Estimated</i> August 19, 2004
Deadline to Submit Proposals	September 7, 2004 4:00 p.m.
Review Proposals	September 8 – October 8, 2004
Interview Applicants (if necessary)	<i>Estimated</i> October 25 – 28, 2004
Post Notice of Award	<i>Estimated</i> November 12, 2004
Energy Commission Business Meeting	<i>Estimated</i> December 15, 2004

A. Questions Related to Wind/PIER Renewables Energy Program Area

A1. What is the PIER Program and How is it Related to this Wind Targeted Solicitation?

In 1996, Governor Wilson signed into law Assembly Bill (AB) 1890 (1996 California Statutes, Chapter 854) which provided authority for a fundamental restructuring of California's electric services industry. Among other things, AB 1890 added Section 381 to the Public Utilities Code, requiring that at least \$62.5 million be collected annually from investor-owned electric utility ratepayers for “public interest” energy RD&D efforts not adequately provided by competitive and regulated markets. Of this amount, the Energy Commission administers \$61.8 million per year through the PIER program.

Since the funds for the PIER program are paid by specified investor owned utility (IOU) electricity ratepayers, the RD&D efforts supported by these funds *must* provide benefits to these electricity ratepayers. However, while the program will emphasize electricity-related RD&D activities, RD&D efforts that benefit other types of energy users may also qualify for PIER funding *if* such projects *also* provide benefits to electricity ratepayers as well.

On September 30, 2000, the Governor signed AB 995 (Wright) extending PIER until January 1, 2010 and allocating \$62.5 million per year to the program.

Following a statewide collaborative effort, the Energy Commission adopted its “*Strategic Plan For Implementing The RD&D Provisions Of AB 1890.*” (Energy Commission Publication No. P500-97-007, June 1997.) The Energy Commission’s RD&D Strategic Plan identified the overall mission of the PIER program as follows:

“The mission of the ‘Public Interest Energy Research’ program is to conduct public interest energy research that seeks to improve the quality of life for California’s citizens by providing environmentally sound, safe, reliable and affordable energy services and products. ‘Public interest energy research’ includes the full range of research, development and demonstration activities that will advance science or technology not adequately provided by competitive and regulated markets.”

With abundant windy resource areas in the state, the potential exists to increase penetration of wind resources and provide solutions to the state’s heavily constrained electricity infrastructure. PIER’s efforts in supporting wind energy forecasting efforts to better integrate existing high wind resource and developing new areas with low wind speed potential to increase wind penetration is consistent with stated program goals.

A2. What are PIER Program Areas?

Senate Bill (SB) 90 was enacted into law (1997 California Statutes, Chapter 905) in 1997. Among other things, this legislation established certain administration and expenditure criteria for the PIER Program, and required the program portfolio to include five “relevant core subject

areas.” The five core research subject areas included in PIER were renewable energy, environmentally preferred advanced generation, energy-related environmental enhancements, end-use energy efficiency, and strategic energy research. (See Public Resources Code Sections 25620 *et seq.*). After the passage of SB 90, the Energy Commission divided the end-use energy efficiency core subject area into two efficiency program areas, namely (1) Buildings, and (2) Industrial/Agricultural/Water.

In the renewable energy program area, there are 6 subject areas being covered: wind, biomass photovoltaic, solar thermal, geothermal and small hydro.

This Solicitation covers wind RD&D within the Renewable Energy Program area. Specifically, this Solicitation targets accelerated development and demonstration of wind industry technologies to firm up wind generated electricity and operate competitively in what is typically considered lower energy wind resource regimes.

A3. What is the Purpose of this Wind Targeted Solicitation?

The purpose of this Solicitation is to conduct RD&D that will accelerate the development of wind turbine system technologies for operation in lower speed wind resource areas and couple the systems with an intermittency management capability (IMC) that will improve integration and dispatchability of wind energy in the state’s electricity system. California has the largest quantity of installed wind capacity in the nation. However, California only ranks 17th in the availability of high speed wind resource areas. High-energy wind resource areas are typically classified as Class 5 and higher (at 10m) using levels developed by DOE/NREL. Many of the high wind resource areas within the state have been developed over several decades with dedicated transmission infrastructure to connect to the electrical grid. With abundant lower speed wind resources intermixed among rural and farm lands as well as within or adjacent to urban centers, developing cost-effective and reliable lower speed wind generation resources can significantly benefit and meet the special electricity demands of these areas. For example, rural areas electricity users are typically connected at the end of transmission branches and distribution lines. Though there is sufficient land, adding new services or upgrading services in these remote and less populated areas tend to be a lower priority in electricity utility planning. Conversely, heavily populated urban areas are often confronted by severe transmission constraints that cannot be resolved by adding new services locally or upgrading transmission due to land use or public considerations. Development of generation close to demand sources (within 50 to 100 miles) provides additional services at the end of transmission or distribution lines and offers relief to transmission congestion. Incorporating an IMC strategy provides additional benefits to the state’s electricity ratepayers by meeting peak demand hour needs.

Thus, the purpose of this Solicitation is to fund the development and demonstration of lower speed wind generation systems with the potential to increase electricity generation throughout the state (includes rural and urban centers) in ways to help resolve the state’s already constrained electricity infrastructure. By widely dispersing wind generation facilities throughout the state and advancing an intermittency management capability, these renewable systems will provide end-users new options to improve on-site, local demand of electricity in both grid connected and

off-grid configurations with the biggest benefits obtained through grid-connected systems located near urban and rural areas.

(Note: DOE/NREL wind class categories - <http://rredc.nrel.gov/wind/pubs/atlas/tables/A-8T.html>)

A4. Why Target Expanded Wind Resources and IMC for Electricity Generation?

In the summer of 2000, California residents experienced disruptive power outages, rolling blackouts and saw astronomical changes in wholesale electricity prices. Aggravated by the shortage of natural gas, rapid urban development, lack of new generation capacity, the unusually hot summers and cold winters, and an overall de-emphasis on energy efficiency programs, the electricity market restructuring became the most visible culprit of the ensuing energy crisis. Four years later, California ratepayers are still dealing with the repercussions of an unstable and deficient market structure. To shield California from future fuel supply shortages and market volatility, the development of a sound electricity infrastructure that includes a clean, affordable and diversified generation portfolio rich with renewable generation remains one of the best investments for the future.

Existing wind capacity can be found in five geographic areas in the state: Altamont Pass, Tehachapi, San Geronimo, Pacheco and Solano areas. These sites are well known high speed wind resource areas (Class 5 and higher) and are generally located in remote, rural locations that required substantial investment and construction of transmission and distribution (T&D) infrastructure over the last two decades. Accounting for less than 0.001% of the total land area within the state, a number of new high speed wind resource areas have been identified for future development. However, in order to become a reality, these sites will require expensive and time-consuming siting and construction of T&D infrastructure. Fortunately, California also has significant untapped lower speed wind resource areas (Class 3 to 4) closer to demand centers and located near urban and rural farm areas with existing T&D capacity. Covering 3 to 5 times more land area as compared to higher wind speed resource areas, expanding into these lower wind resource areas in conjunction with repowering and new developments in high wind speed resource sites could significantly help achieve the accelerated RPS goals set forth in the Energy Action Plan.

Next to large hydro and geothermal, wind generation is one of the principal renewable electricity sources for California, accounting for approximately 1.3% of the electricity used in the state. Representing over 1800 megawatts (MW) of emission and fossil-free electricity for the state, wind-generated electricity will remain an integral and vital component of California's diverse electricity generation portfolio. With rapid project planning, construction and deployment, wind resources are projected to provide the lion's share of the new renewable capacity despite having an intermittent generation profile.

Intermittency is a challenge that may prevent a significant level of penetration by wind generating resources. Though the Energy Commission and industry are evaluating near real-time wind energy forecasting capabilities to improve the scheduling of wind resources into the

generation mix, wind forecasting alone cannot resolve the issue that when the wind stops blowing, wind turbine facilities stop generating electricity. Resolving problems associated with wind's intermittent nature requires industry's participation, innovative solutions and demonstration of system management techniques that increase confidence of grid operators and schedulers who deal with incorporating wind generated electricity. Lower speed wind resources may be more conducive to firming as they generally have more consistent wind profiles throughout the year than higher speed resources. Lower speed wind resource areas may also have higher winds aloft that can be harnessed by turbines designed to operate in both low and high speed wind resource areas. Similarly, local wind resources may be coupled with other generation resources to provide time shifting towards "high value" peaking generation capability. The concept of managing the intermittency with alternatives is not new but is something that has not been actively pursued as part of a complete wind generation package. Innovative solutions exist for intermittency and the goal of this Solicitation is to help realize them.

A5. What is the Scope of Acceptable Projects?

To address California's energy issues and meet RPS goals, RD&D must be directed at meeting California specific needs. Proposals are being solicited to demonstrate the viability and benefits of expanding advanced turbines into lower wind speed resource areas and demonstrating improved compatibility on the grid by incorporating intermittency management capabilities (IMC). In general, proposed projects must integrate technology and prime movers to address the following:

- Increase wind turbine penetration into lower wind speed regimes by:
 - Demonstrating new turbine systems and system technologies that have undergone initial design and development phase
 - Capturing and characterizing the low speed wind resources at a test site and compare profiles to higher speed wind sites presenting anticipated megawatt capacity build-out and generation (kWh)
 - Field testing of turbine systems at a selected Class 3 wind resource site in California
 - Conducting performance tracking and data collection for purposes of future certification or expanded rating
 - Continuing contributions to lowering of costs in the new operating regime: capital cost, installation cost, operation and maintenance cost, and life cycle costs of turbine systems
- Improve the cost competitiveness and affordability of lower speed wind turbine technologies coupled with IMC into electricity systems by:
 - Conducting feasibility and resource assessment of wind coupled with a firming capability (storage, hybrid generation, purchased power) based on resources at a site
 - Evaluating and describing benefits of management methodology and goals, technology tradeoff and cost analysis
 - Demonstrating integration of IMC
- Assure high likelihood of success and market connectedness by:

- Employing an experienced wind project development team capable of implementing successful project deployment in the California market place
 - Having utility involvement and interconnection perspective early on the project
 - Having a clear and timely commercialization pathway with a means of industry integration
 - Developing a complete product concept with overarching goals that are to be achieved when the product is market ready
- Improve the value of wind generation systems to California's electricity system by:
 - Enhancing system reliability, peak load capability, dispatchability, availability, maintainability, durability, usability, and power quality
 - Supporting integration and aggregation of distributed generation and on-site generation with the power grid
 - Improve wind energy systems that enhance environmental and public health benefits by:
 - Improving public health and safety (e.g., CEQA compliance, noise and visual impact mitigation, good faith effort to avoid avian and terrestrial animal impacts, etc.)
 - Reducing environmental impacts by increasing confidence in a fuel-free, emission free reliable wind resource

In light of these considerations, the Energy Commission is particularly interested in developing and demonstrating lower speed wind turbine system technologies in conjunction with intermittency management capabilities in the topics identified below:

Low Speed Wind Turbine System Technologies

- Innovative prime movers and advanced concepts currently not being demonstrated (e.g., extendible rotor blades, flexible rotor/blade technologies, active and passive control etc). Please note that proposals must address benefits of technology other than COE reductions due to advanced power electronics.
- Demonstrate cost-effective electricity production at transfer station.
- RD&D focused on demonstrating economic turbine operation and performance in lower energy, low wind speed areas.

And

Intermittency Management Capabilities

- Innovative coupling of technologies to firm up wind generated electricity or supplement it in ways to reduce the intermittent profile.
- Testing and demonstrating of innovative prime movers (e.g., pumped storage, alternative generation, facility negotiated power purchase for the grid, etc.).
- Steps to increase affordability of integrating IMC as an overall wind turbine management system (e.g., by including co-production of value-added products for storage or backup, increasing efficiencies, smoothing the wind profile, etc.).

Proposed RD&D projects must also furnish a 3-D, scaled-model of the wind turbine to the Energy Commission for display and presentation purposes. Proposals outside the above areas

will also be considered. However, a project must address development and demonstration of reliable, cost-effective lower speed wind resources in conjunction with intermittency management capability. Applicants proposing such projects must describe how the project addresses cost-effective development of lower speed wind resources in conjunction with IMC, other critical electricity issues, the extent of environmental benefits, and a commercialization pathway. In addition, such proposals must fully respond to the requirements of Volume 2, Technical and Cost Information Section of the Application Manual.

Proposed RD&D projects must include hardware development of pilot plants or prototype demonstration units. Feasibility studies and bench scale projects will not be funded under this Solicitation. Applicants who are proposing feasibility studies and bench scale projects should consider applying to the Energy Commission's Energy Innovation Small Grant Program. Similarly, other funding is available to reduce peak load and energy consumption using commercially available technologies through the Energy Commission's Distributed Generation, and Renewable Energy Programs. Information on these programs is available through the Energy Commission's web site (<http://www.energy.ca.gov>).

A6. What are the Targets and Stretch Goals for this Solicitation?

In view of the above scope and focus of this Solicitation, Applicants should use the following Targets and Stretch Goals in developing their project applications. Note that these targets and stretch goals are quantitative.

Table 1. Performance Targets and Stretch Goals for Expanded Wind Regime Turbine Technology and IMC Demonstration Solicitation

Focus Area	Target Parameter	Agreement Target	Stretch Goal
Turbine Component/ System	Wind Regime based on NREL wind class at 10m (W/m^2)	Class 4 at 10m	Class 3 at 10m
	Affordability COE (\$/kWh)	< 0.05	< 0.03
	Installed Cost for Generation Onshore Prime Mover (\$/kW)	< 1,100	< 1,000
	Capacity Factor (%)	> 25%	> 35%
Intermittency Management Capability	Average power (kW)	> 750	> 6000
	Performance Discharge time (hr)	> 2hr	> 6hr
	Recharge time (hr)	< 4hr	< 8hr

	Usage frequency (days/month)	> 20	≈ 30
	Electricity conversion efficiency (%)	> 50%	> 80%
	Capacity Factor with IMC (%)	> 40%	> 50%
	Affordability COE adder (\$/kWh)	< 0.04	< 0.015

A7. How Much Financial Assistance is Available?

The total PIER funding for this Solicitation is anticipated to be up to \$5 million. A single proposal may request no more than \$1.75 million in PIER funding and is anticipated to last 2-3 years. The Energy Commission expects to award 1-3 grants. The Energy Commission reserves the right to augment or reduce these amounts during this Solicitation process.

An Applicant may submit only one proposal per project. However, an Applicant may submit multiple proposals if each proposal is for a different project.

A8. What are the Match Funding Requirements?

Match funding is required to participate in this targeted Solicitation and match funding is evaluated and scored as one of the evaluation criteria. The minimum direct cost sharing required of industry participants will be 50% of total project costs and greater consideration will be given during the evaluation process to proposals that exceed the 50% minimum. Match funds from other public sources will be allowed however a minimum of at least 20% of cost sharing must still come from private sources. Private sources refer to funding from sources other than the federal government, California or other state governments or other governmental entities such as cities and counties.

Care should be taken to provide match funding in amounts proportional to expected private benefits compared to public benefits generated by the program. In other words, projects providing a higher percentage of private benefits and lower percentage of public benefits should contribute a higher percentage of match funds. The ratio of match funding to PIER funding should reflect the ratio of private benefits to public benefits resulting from successful completion of the project. For additional information regarding match funding, see Section III. B4. Section 7., “Project Costs.”

A9. Will this Award be a Grant, Loan or Contract?

All funding through this Solicitation will be provided as grants.

A10. How and When will Funds be Distributed?

Energy Commission funds are paid on a reimbursement basis. Payment will be made approximately 45 days after the Energy Commission receives a properly submitted, undisputed invoice with appropriate status reports indicating appropriate progress. The Energy Commission will retain 10 percent of any payment request or 10 percent of the total Energy Commission award at the end of the project. These retained funds will be released when the Energy Commission Project Manager is satisfied that the terms of the grant agreement have been fulfilled.

A11. How do I Apply and What is the Process?

First, the Program Opportunity Notice and Application Manual for this Targeted Solicitation are released. Then, a pre-proposal conference will be held at the Energy Commission office in Sacramento to respond to Applicants' questions. The Energy Commission will distribute questions and answers received from the pre-proposal conference and post them on the Energy Commission website. Applicants are required to submit a detailed proposal by the due date and time. Energy Commission staff will conduct eligibility, completeness, and feasibility screening of proposals. Proposals that do not pass the eligibility, completeness, and feasibility screening criteria will not advance to the next stage of proposal review, which is the evaluation and scoring phase. The scoring committee will independently evaluate and score proposals. Then the proposals receiving passing scores will be submitted to the Energy Commission's RD&D Committee. The RD&D Committee reviews and recommends to the full Energy Commission how many of these projects to fund, beginning with the highest score (in descending order). The Energy Commission then approves the final grant agreements to the winning Applicants.

Applicants are required to submit as much technical information as they believe is needed to describe their proposed Expanded Wind Regime Turbine and IMC advancements. Applicants are required to provide a copy of turbine and component schematics, along with other supporting documents as outlined in "What is Required in Volume 2- Technical & Cost Information for a Proposal."

A12. Who can Apply to this Solicitation?

This is a targeted Solicitation seeking wind turbine manufacturers and technology developers (Applicants) to be the primary lead for the grant. To be eligible, Applicants must present a team with:

- 1. a demonstrated commercialization capability (i.e. bringing large complex systems/products to market);*

AND

2. *a U.S. base of operation (i.e. manufacturing facility for major components, subassemblies in the U.S. or satellite R&D office which provides economic interest to the U.S.)*

Previous Energy Commission or DOE grant Recipients who have successfully demonstrated expertise and experience with development and testing of full, utility-scale wind generation systems and comply with the above requirements are also encouraged to apply. Both private and public entities may apply for PIER funds. This Solicitation represents a complementary and bridging RD&D effort to the U.S. DOE Low Wind Speed Turbine (LWST) Development Program. Applicants under the LWST who meet the eligibility requirements are encouraged to apply to this Solicitation.

It is the responsibility of the Applicant to organize and manage the RD&D team to fulfill the Solicitation objectives. A minimum recommended team should include prime movers involved in the following areas:

- technology development (i.e., wind turbine technologies R&D, intermittency/storage devices R&D, other renewable generation technologies)
- transmission integration (i.e., utility providers, municipal utilities)
- intermittency integration (i.e., transmission and interconnection technologists)

Teams of subcontractors may also include any or all of the following: individuals, businesses, land and farm owners, developers, and public or private research institutions and laboratories.

A13. Will there be Opportunity to Meet with the Energy Commission about this Solicitation?

Yes, as indicated in the schedule, there will be one Pre-Proposal Conference in Sacramento; participation in the meeting is optional but encouraged.

Current plans are to hold the Pre-Proposal Conference on the date, time, and location listed below. The date, time and location of meeting are subject to change. Please call (916) 654-5129 or refer to the Energy Commission's web site at www.energy.ca.gov to confirm the date and time.

**Sacramento, CA
August 12, 2004 (Thursday)
1:00 p.m. to 3:30 p.m.
California Energy Commission
Hearing Room B, First Floor
1516 Ninth Street
Sacramento, California 95814
PIER Renewables RD&D Office: (916) 654-5129**

A14. How Do I ask Questions about this Solicitation?

During the Solicitation process, questions or clarifications about this Wind Targeted Solicitation must be directed to the Wind Technical Lead as listed below. You may submit written questions up to the day of the Pre-Proposal Conference and you may ask questions at the Pre-Proposal Conference. Questions may be submitted in writing via mail, electronic mail, or FAX. The questions and answers will be mailed to all parties who request a copy of this Application Manual from the Energy Commission Research and Development Office or attend the Pre-Proposal Conference. The questions and answers will also be posted on the Energy Commission's web site at: <http://www.energy.ca.gov/research>

A15. Who Do I Contact for Information Regarding this Solicitation?

DORA YEN-NAKAFUJI
WIND TECHNICAL LEAD/PIER RENEWABLES
Research and Development Office
California Energy Commission
1516 Ninth Street, MS-43
Sacramento, California 95814
Telephone: (916) 653-4128
FAX: (916) 653-6010
E-mail: dyen@energy.state.ca.us

Verbal Communication:

Any verbal communication with an Energy Commission employee concerning this Solicitation is not binding on the State and shall in no way alter a specification, term, or condition of the Application Manual.

B. Questions Related to Proposal Format and Required Documents

This section contains the detailed technical and mandatory proposal format requirements and the approach to be used by the Applicant for the development and presentation of proposal information and data. The format is prescribed to assist the Applicant in meeting State requirements and to enable the Energy Commission to evaluate each proposal uniformly and fairly. Format instructions must be adhered to, all requirements and questions in the Solicitation must be responded to, and all required data must be supplied.

B1. Is there a Limitation in the Proposal Format and Length?

Proposals must be presented in a clear, complete, and concise manner. Volume II and optional Volume III shall be kept to a combined maximum of forty (40) pages of text (not including the required application attachments, Work Statement, budget spreadsheets, and resumes offered by the Applicant). Applicants are required to limit the length of their proposals while adequately covering the proposal requirements.

B2. What is the Required Format for a Proposal?

All proposals that are submitted under this Solicitation must be typed or printed using a standard 11-point font or larger on 8-1/2" x 11" paper, singled-spaced, and contain a blank line between paragraphs. Pages must be numbered and sections must be titled. Pages should be arranged back-to-back with odd-numbered pages on the right. Hardcopies should be bound. Colored photographs and colored graphs are discouraged. Tables and figures should be referenced by number and every page should be numbered sequentially. Cite relevant publications, references and achievements but copies should not be included.

Applicants must submit the bound hardcopies of the original and 10 paper copies of Volume 1, Volume 2, and optional Volume 3.

Applicants must also submit electronic files of the proposal on CD-ROM with clearly labeled contents along with the paper submittal. Electronic files must be in Microsoft Word and Excel formats (compatible with '97 versions or later).

Electronic files submitted via e-mail will not be accepted.

Applicant(s) must organize the proposal as follows:

Volume 1 – Administrative Section
Cover Letter
Application and Project Information Form, Attachment A-1
Project Team List, Key Personnel, Key Subcontractors, Attachment A-2
– Narrative Description of Skill and Experience
– Key Personnel and Key Subcontractors form
– Resumes
Financial Information Form, Attachment A-3 (Private Entities Only)

Volume 2 – Technical and Cost Section
Table of Contents Executive Summary, Attachment A-4 Technical Narrative <ul style="list-style-type: none"> Section 1: Scientific and Technological Baseline, Resource Assessment of Current Technologies, Technical and Economic Feasibility Study with Costs Section 2: Problem Statement Section 3: Project Goals and Objectives Narrative System Performance Characteristics, Targets and Stretch Goals Section 4: Technical Approach and Probability of Success Section 5: Market-Connected Benefits of Successful Completion of the Project and Market Partners Section 6: Work Statement, Attachment A-5 Products, Due Dates and Gantt Chart, Attachment A-6 Section 7: Project Costs: <ul style="list-style-type: none"> – PIER Funding Request Narrative – Match Funding Narrative – Need for PIER funding narrative – Project Budget Forms, Attachment A-7: <ul style="list-style-type: none"> ○ Personnel Hourly Rates and Benefits ○ Detailed Task Budgets Miscellaneous (if applicable): Permit List, Attachment A-8
Volume 3 – Confidential Information, if applicable
Confidential Products and Pre-existing Intellectual Property, Attachment A-9 Copies of Confidential Submittal

B3. What is Required in Volume 1 - Administrative Information?

The following is a list and brief description of the items (sections) that must be submitted in Volume 1 of each proposal. Applicants should carefully read this format and content information (along with the eligibility, completeness and feasibility criteria, and the evaluation criteria presented subsequently) to understand the relative importance of the information being requested in the proposal. The following items must be included or the proposal will fail the completeness screening and will be rejected prior to technical evaluations.

1. Cover Letter

The Applicant must submit a cover letter on company letterhead signed by a person who has the authority to bind the Applicant to a grant agreement for the proposed work.

2. Application and Project Information Form

Complete the Application and Project Information Form (Attachment A-1). Have a person who is authorized to sign the grant agreement for your company sign the original of this form as the “Authorized Official.” Note that this form requires submittal of Articles of Incorporation, Partnership Agreement, and Fictitious Name Filing where appropriate.

3. Skills and Experience

Project Team Narrative

Name the Project Director who will be the Grant Award Recipient’s person primarily responsible for coordinating and managing the proposed project and describe each of the following:

- The Project Director’s capabilities and experiences in managing successful wind development and demonstration of RD&D projects.
- The Project Director’s experience in bringing wind energy systems or comparable complex systems successfully to the marketplace.
- The process the Project Director will take to effectively manage the proposed project to achieve project objectives and goals, including ensuring the development of quality products within the allocated budget and schedule.
- How the Project Director will monitor progress and develop recommendations for adjusting the research direction and focus based upon the results of research.

Describe the capabilities and experience of the proposed project team:

- Identify the key RD&D personnel of the Recipient, key subcontractors, and key personnel of the key subcontractors.
- Describe the capabilities of the team members to conduct the technical work proposed, administer the research process, control costs, maintain project schedule, and if applicable, move the products into the marketplace, with reference to past experiences.
- Describe how the project team is uniquely or unusually well qualified to perform the proposed effort.
- Describe any key industry partners necessary to ensure project success and to move the development of low speed wind systems successfully into the California electricity markets.

Project Team List, Key Personnel and Key Subcontractors

List Recipient’s key personnel, subcontractor’s key personnel and key subcontractors in the project, on Application Manual Attachment A-2.

Briefly, “keys” are those individuals or subcontractors/vendors who would be difficult to replace and could impact the project progress/outcome. The Energy Commission has approval rights if replacing these individuals or subcontractor/vendors.

Resumes

Provide resumes for the Project Director, the task leaders, key project team members and key subcontractors. Emphasize individual accomplishments in the resumes relevant to the proposed project.

Financial Information

Private entities must complete the Financial Information Form (Attachment A-3). Submit requested copies of documents and financial statements. A financial review will be conducted as part of the review process to assess the Applicant’s ability to provide match funding and successfully complete the project.

B4. What is Required in Volume 2 – Technical and Cost Information?

The technical merit of the proposal will be evaluated and scored on the Applicant’s submittal in the Technical and Cost Section of the Proposal. The Applicant is responsible for submitting a technically complete and responsive proposal, and for presenting compelling and convincing evidence that the proposal is worthy of PIER funding. In scoring the proposal, the Energy Commission evaluation team will *NOT* depend upon its prior detailed knowledge of expanded wind turbine system technological status, intermittency management technological status (e.g. storage, SMES, batteries, pumped hydro, hybrid generation, etc), issues and markets, or any prior work that the Applicant has done for the Energy Commission. Therefore, the Technical and Cost Section of the Proposal should be complete but clear and concise and should address the submittal requirements completely.

The Applicant can assume that proposal evaluators are familiar with the electricity supply and demand situation in California, natural gas supply issues, wind issues, electric utility restructuring, proceedings before the Energy Commission and the California Public Utilities Commission related to: wind systems, avian issues, renewable distributed generation and interconnection, and interconnection issues and standards development. Therefore, the Applicant should not discuss issues such as the potential for wind systems to be used as Distributed Energy Resources (DER) and the roles that DER can serve in terms of system reliability and electricity supply, unless such discussions are critical to an understanding of the scope of the proposal’s work statement. The Applicant’s discussions should always focus on the proposed project and expected results.

Applicants who believe that supporting documentation beyond that requested for Volume 2 is needed and will improve their technical score may attach such information in appendices to their proposal but must not exceed the maximum (40 pages) proposal limit. Appendices are appropriate for items such as description of work being done by the project team on related

projects, the Applicant's quality control and quality assurance plans and procedures, calculations of public and private benefits and associated discussions, calculations of performance enhancements resulting from successful completion of proposed work, calculations of cost reductions resulting from successful completion of the proposed work effort, and copies of team publications relevant to the proposed work. Any item submitted in an Appendix should begin with a summary of the relevance of that item to the proposal and the evaluation criterion to which it applies.

Volume 2 must contain the technical and cost information that responds to the Solicitation, and with the exception noted below, should be presented in the order listed below. There must be a Table of Contents, with page numbers for each section, and an executive summary before Section 1. The sections in Volume 2 are organized into two groups, Sections 1 through 5, and Sections 6 through 7.

The purpose of the Technical Narrative (Sections 1-5) is for the Applicant to provide a compelling narrative or "story" that justifies PIER funding of the proposed project. The Applicant should demonstrate a clear understanding of the state-of-the-art of the technology, the goals and objectives of the project, the niche filled by the proposed project in ongoing technical developments, the technical and economic feasibility and significance of the results to be derived from successful completion of the project, resource assessment, market needs and economics, the way in which these results will be accepted in the marketplace, and the public benefits to be derived by California electricity ratepayers. We have divided this "story" into the following topics:

Section 1. Scientific and Technological Baseline

- Resource Assessment and IMC technologies
- Technical and Economic Feasibility Studies, Tradeoff and Benefits
- Transmission and Utility Integration Issues in General, for the Region and Site

Section 2. Problem Statement

Section 3. Project Goals and Objectives

Section 4. Technical Approach and Probability of Success

Section 5. Market-Connected Benefits of Successful Completion of the Project.

The boundaries among the above topics may be somewhat arbitrary. There is no need to repeat information from one topic to the next. If rearranging the order of two or three of the above topics helps to present your project in a logical fashion, then that is acceptable.

The second group of topics describes the specific details of the Applicant's proposed RD&D project, and must be presented in the following numerical order:

Section 6. Work Statement and Products, Due Dates and Gantt Chart

Section 7. Project Costs, PIER Funding Request, Match Funding, the Need for PIER Funding and project budget forms

Below is a detailed description of the information the Applicant should present in the executive summary and Sections 1 through 7 of Volume 2.

Executive Summary (Attachment A-4)

Prepare an Executive Summary of the project, no longer than two [2] pages, which describes in summary form:

- The problem, barrier, or deficiency, amenable to an RD&D solution, that the proposed project will address in relationship to other current work in the field
- Proposed turbine and IMC technology or science being developed and advanced
- General description of wind resources/regime to be utilized in the proposed demonstration and resource assessment
- Technical and economic feasibility studies
- Market needs and assessment
- The unique products, services, or levels of understanding that are expected to result from the project
- The technical approach and project steps that explain what will be done and how it will be done
- The quantitative goals and objectives of the project
- The overall project cost
- The amount of PIER funding being requested
- The amount, sources, and nature of match funding (note limitations on match funding Section III. A8. “Match Funding Requirement”)
- The types, estimated amounts, and timing of public benefits to be provided in California if the project is successful and if the results are incorporated into commercial products. California public benefits include, but are not limited to, the annual amount of energy to be saved, cost competitiveness, the amount of electrical power price reduction expected, reduction in environmental impacts, such as the tons per year of pollutants reduced, market penetration levels, the installed capacity of wind and prime movers in a specified future year, and/or the degree to which system reliability, dispatchability, maintainability, usability, flexibility, or power quality is enhanced.
- Estimated amounts of additional time and spending, if any, required to realize the public benefits that are being claimed for this project. Identify the types of entities that would be involved in these additional efforts.

Technical Narrative

Section 1. Scientific and Technological Baseline

Describe the scientific and technological baseline, that is, the current state-of-the-art or the developmental status of the subject technology to be advanced. Relate the developmental status of the subject technology to the performance of lower speed wind turbine and IMC technologies and to the relevant performance targets and stretch goals in Section III, Table 1.

Identify entities engaged in development of the subject technology. If no one else is performing any related development work, state that explicitly and reasons why you believe work is warranted in this area. Identify whether or not the proposed project duplicates or overlaps other ongoing RD&D.

Emphasize past advances that the Applicant's team has made in areas relevant to the proposed work. Describe Applicant's relevant work, accomplishments, failures, ongoing work, RD&D projects, funding levels, and funding sources. Be quantitative and rigorous in the discussion. List research papers, conference papers and presentations with full references, and summarize significant accomplishments that have been reported.

Within the technological baseline discussion, it may be advantageous for the Applicant to discuss the status of the technologies in general in order to put the proposed work within the context of generating system development. The discussion could include factors such as developers and manufacturers, development status (whether laboratory scale, alpha testing, beta testing, commercially available), performance characteristics and tradeoffs (efficiency, lifetime, emissions and other environmental characteristics including footprint and land requirement), manufacturing cost and selling price, and operation and maintenance costs.

Resource and market assessments and the technical and economic feasibility study of the proposed technologies should be included in this section. Resource assessments should include calculation and discussion of the feasibility of the wind resources that will be used for the proposed project in a proposed location or site.

The scientific and technological baseline described here must facilitate the evaluation of the proposed RD&D effort. That is, there must be continuity between the current status of the subject technology and the proposed effort.

Section 2. Problem Statement

Describe the deficiencies that exist for the subject technology. The deficiencies should illuminate the question of *why* the proposed project should be done.

Identify and discuss the principal barriers, key unresolved issues, and knowledge gaps that hinder the development and widespread use of lower speed wind systems and IMC in

California that your proposal addresses. Barriers may be grouped under the following categories or other categories that the Applicant deems appropriate:

- Scientific and technological – such as insufficient scientific understanding of relevant biochemical phenomena and processes, inadequate materials, high cost of materials, poor durability, low reliability, low power density, low energy density, lack of detailed engineering designs and design trade-off analyses, inadequate component development, high cost of fabrication techniques, lack of automated manufacturing, insufficient field testing, or insufficient field demonstrations.
- Market – such as inadequate consumer knowledge or limited system supply and maintenance infrastructure. (Note: This Solicitation does not seek and will not fund proposals for market research, technical and economic feasibility study, resource assessment, consumer education, commercialization, or market conditioning activities.)
- Institutional – such as regulatory hurdles (e.g., atmospheric emission limitations, lack of tax incentives, land use requirements, transmission constraints, regulatory acceptance, etc.) or lack of adopted interconnection standards.
- Environmental – such as NO_x emissions above those set by Air Resources Boards or Districts within California, avian and terrestrial animal impact, excessive noise, or other resource consumptions.

Explain why these barriers have not been addressed by the marketplace or by other institutions.

Explain why the barriers should be addressed at this time. For example, place the proposed work into the context of the spectrum of barriers that these systems face regarding widespread deployment, adoption, acceptance and market penetration. Identify if possible the sources of these barriers. Discuss any perspectives on issues that are of particular importance and that are addressed by your proposal. Be succinct and as quantitative as possible.

Section 3. Project Goals and Objectives

At the beginning of this section, complete the following sentences. Please be succinct.

Overall Project Goal

The overall goal of this project is to...(Complete the sentence with a brief description of the goal(s). Goals can be technical, economic or social. Please be brief, two to three sentences maximum.)

This project meets the PIER Goal of <pick primary one from the list below> by <fill in the blank>. (If applicable, this project also meets the secondary goal(s) of <pick all that apply from the list below> by <fill in the blank>.)

PIER Goals

1. Improving the Energy Cost/Value of California's Electricity
2. Improving the Environmental and Public Health Costs/Risk of California's Electricity
3. Improving the Reliability/Quality of California's Electricity
4. Improving the Safety of California's Electricity

Technical and Economic Performance Objectives

Clearly and quantitatively specify technical, economic and/or environmental goals for the project/product. Note that goals are to be linked to the benefits in a way that enables the team to provide overall estimates of the benefits if the product successfully penetrates the marketplace. Goals should also be related back to the critical issues being addressed.

The technical performance objectives of this project are to...(Complete this sentence with the technical objectives, which are things that will be measurable or knowable at the end of this project. Applicants should determine technical performance measures that are applicable to their projects).

The economic performance objectives of this project are to...(Complete this sentence with the economic objectives, which are things that will be measurable or knowable at the end of this project. Applicants should determine economic performance measures that are applicable to their projects).

Provide factual baseline performance and cost data for current technologies and systems. Examples of Technical and Economic Performance Measures:

- . . .reduce the cost of electricity generation (or supply) by ____%.
- . . .increase the number of new technologies that are market-ready by ____<fill in the number>.
- . . . increase the adoption by the market of specific technologies by ____%.
- . . . increase the renewable technologies that are cost competitive by ____%.
- . . . increase the new energy systems that can use multiple fuels by ____%.
- . . . decrease end-use consumption in specific energy sectors by ____%.
- . . . decrease the new energy system impacts over current best practices by ____%.
- . . .increase the number of market-ready technologies that contribute to reduced risks of increased environmental/health impacts by ____<fill in the number>.
- . . .reduce the interruption frequency and duration per customer type per year by ____<fill in the number>.
- . . .increase the expected number of new technologies providing increased reliability/quality choices to consumers by ____<fill in the number>.
- . . .decrease the rates of injury and fatality associated with electricity generation/supply and usage by ____<fill in the number>.
- . . .determine the effectiveness of the XYZ process.

After completing the sentences above, discuss how and to what degree your proposed project contributes to realizing the targets and stretch goals, or other significant contributions leading to system improvement and market introduction and penetration in California. The targets and stretch goals for this Solicitation are given in Table 1, Section III.

As a hypothetical example of meeting other significant goals, your project may not be able to reach a Solicitation capital cost target of \$1100/kW for an expanded wind regime system coupled with IMC by 2008, but your project may be able to reach a capital cost of \$1500/kW by 2006. If this higher capital cost provides an improvement over the baseline technology, your project might offer public benefits equal to or greater than those offered by another proposed project that claims the ability to reach the hypothetical \$1000/kW cost target, but several years later.

Proposals for IMC projects must discuss the tradeoffs that must be made in achieving improvements in one performance parameter while compromising improvements in one or more other parameters. Discussion must also include technology fit to the local area resources and electricity usage or demand needs (regional or local area benefits).

If your project incorporates other generation technologies (such as solar, combined heat and power systems), identify the sources and market applications. Discuss the match between wind system, IMC and thermal/electrical outputs of the combined technology system with the load profiles of the expected end use sites. Show needed calculations for expected performance efficiencies.

List and describe the technical or economic performance goals (improvements in technology or the state of knowledge that can be measured and quantified) for your proposed project. Your goals must be quantitative, verifiable and measurable by physical observation or testing. If the improvements that your project will make are not amenable to measurement, surrogate performance metrics that can be measured must be given. Describe the methodology or procedure that will be used at the completion of the project to determine if the goals or performance metrics have been achieved.

List and describe the technical or economic objectives—desired conditions outside the project itself that will result from the success of the project.

Section 4. Technical Approach and Probability of Success

Explain how the proposed work extends or complements prior RD&D. That is, continue the discussion given under “Scientific and Technological Baseline.” Explain how and why the proposed RD&D are the next and necessary step.

Succinctly state the specific advances in science and technology that the proposed project will achieve, if successful. Include a clear discussion of where the team is in the overall development of the project/product (include timeline for product development).

Show how a successful project will make a significant difference in the status of the subject technology. Explain the manner in which, and the degree to which (be quantitative), the proposed effort will address and resolve the principal barriers, issues, and knowledge gaps described in the Problem Statement.

Describe any proprietary market or technical information—not currently under your control or to be developed as part of this project—which will be necessary to complete the project. If such information is necessary, describe how it will be obtained. Describe any unresolved intellectual property issues.

Describe the level of risk associated with the project. Discuss the probability that the project will achieve its goals and objectives and that science and technology will be advanced. Discuss the technical viability of the proposed effort.

After answering the previous questions in this section, describe your technical approach. For the project as a whole and for each technical task, present the nature of the work that will be done, the underlying technical considerations, and the technical merit of the proposed project. Explain how scientific and engineering principles will be applied in order to achieve the proposed project's objectives and goals. Identify and describe any innovative or distinctive features of the approach. Explain why any innovative approach is expected to be more successful than prior approaches. Assess risks or potential problems that could prevent the task from being completed on time and on budget. Present alternative contingency approaches where appropriate. Please use the following format, which parallels the task listings in the work statement. *This is the place for the details behind and the rationale for your proposed activities.* In contrast, the work statement is the place for the essential elements (step-by-step) of the process you will use to complete the project.

Technical Approach

Overview of Tasks

Task 2.1 (*Descriptive Name*)

Task 2.2 (*Descriptive Name*)

Task 2.3 – 2.n (*Descriptive Name*)

Section 5. Market-Connected Benefits of Successful Completion of the Project

A key objective of the PIER program is to develop energy products or services that are connected to the market, that is, those that will be installed so that they can produce public benefits for California's electricity ratepayers. Through this Solicitation, the Energy Commission is seeking worthy, fully integrated, state of the art, almost market-ready expanded wind regime turbine technologies and IMC for utility-scale and distributed generation applications capable of providing market-connected benefits to California's electricity ratepayers.

Your discussion of market-connected benefits should be limited to less than two pages; we are not requesting an exhaustive market study. However, if a market study already exists, and is particularly relevant, please provide its reference.

Describe the expected outcomes—the effects on related industry stakeholder communities—if your proposed wind turbine and IMC RD&D project is successful. Identify the beneficiaries and users of the scientific or technological knowledge expected to be gained.

Assume that your project is successful. Describe a plausible scenario leading to commercial introduction of an economically viable wind coupled with IMC generating system/approach. Estimate the time and expense required to reach this point. Estimate the timeframe under which the economic benefits will accrue. Describe any additional activities, beyond those in the Work Statement, that must be taken to achieve these benefits. State any assumptions made in estimating the benefits, and justify the bases for the assumptions.

This discussion should:

- (1) Identify the specific market(s) for products or services resulting from the RD&D efforts,
- (2) Estimate the size of that market, and how much of that market exists in California,
- (3) Provide an overview of the pathway(s) by which such products or services will ultimately enter the marketplace,
- (4) Identify infrastructure changes necessary for commercialization including changes to regulations (environmental, safety, permitting, transmission, industry models),
- (5) Identify people or entities that can aid in facilitating market entry, and
- (6) Describe important incentives these entities will have to commercialize the product.

Demonstration projects should be closely connected to the market. Since your project is for a demonstration or test of a complete wind turbine electricity generating system, clearly identify the market segments (agricultural, residential, commercial, industrial by SIC codes) and service (ancillary services, baseload, peaking, back-up) being targeted. Discuss the match between the output and duty cycle of the generating system and the host load.

Based on the market(s) that you believe will use the results of your successful project, estimate the public and private benefits that will accrue. Categories of benefits include but are not limited to, improved emissions, improved fuel conversion efficiency, reduced cost of manufacturing, and more reliable and durable components. The benefits must derive from the project objectives and goals and be limited to the markets you expect to reach.

Distinguish between the public benefits (especially those to the California electricity ratepayer) of the proposed project, and the private benefits, including those to the Applicant. Apportion benefits between the public and private sectors. Compelling arguments justifying the apportionment should be made if most of the benefits are claimed to be public.

Describe any expected ideas which will have potential patent application.

Depending on the generation technology, note that effective January 1, 2003, all distributed (electricity) generation technologies in California shall be either (1) certified for use by the California Air Resources Board (CARB) and exempted from district permitting requirements, or (2) permitted by a district. Emissions shall be made equivalent to the level determined by CARB to be the best available control technology for permitted central station power plants in California (SB 1298 1999-2000 Session [Bowen], Health and Safety Code Sections 41514.9 and 41514.10). If any portion of your project results will not meet these emission requirements, discuss why non-conformance of the system being developed is appropriate.

Section 6. Work Statement, Products, Due Dates and Gantt Chart

Project Work Statement

Applicant should follow the prescribed work statement format and instructions in this Solicitation (Attachment A-5). The Work Statement shall:

- Be consistent with the proposal's problem statement, objectives, goals and technical approach.
- Contain appropriate detail and clarity to be incorporated directly into a grant agreement.
- Contain a logical sequence of tasks.
- Contain list of products appropriate to each task.
- Contain a timeline connecting current work to Applicant's projected market/development vision.

Within the work statement, the work effort should be divided into a series of logical, discrete and sequential tasks. Instructions and examples for the technical tasks are provided in the Work Statement template (Attachment A-5). Task 1 is reserved for Administrative Tasks related to project start-up, meetings, status reports, final reports and draft reports and outlines. Technical tasks are found in Task 2 of the Work Statement and start with the number 2.1. Applicants must use the task format as described in Attachment A-5.

Details to Include in Task Descriptions:

- Successful completion of this task will be measured by...*(Complete the sentence by listing the performance measure(s) or other criteria that will be used to evaluate the results and to determine to what degree the goal was achieved.)*
- Meeting this goal helps to achieve the project objectives by... *(Complete the sentence.)*
- A description of each work task in the order in which you expect the work to be done. Applicant should not simply propose to perform the work but should outline the actual work to be performed in as much detail as possible. Follow instructions

and examples shown and refer to the work statement template contained in the Application Manual Attachment A-5.

- For project demonstration and testing, one of the tasks must be the development and execution of a Test Plan. The Test Plan should include considerations such as the number of hours of operation, load, fatigue or life cycle testing schedule, type and description of monitoring/measurements to be performed, instrument calibration and experimental setup, methodology in which data will be analyzed and reported, and a Quality Control and Quality Assurance Plan to assure data validity and uncertainty. A Critical Project Review generally will be conducted at the conclusion of this task and prior to hardware testing.
- If your project is for a demonstration and if the demonstration is to be grid-connected, or will develop hardware for grid-connected applications, discuss the degree to which the demonstration will comply with both Supplemental Recommendation Regarding Distributed Generation Interconnection Rules P700-00-014, and Distributed Resources Interconnected with Electric Power Systems, Institute of Electrical and Electronics Engineers (IEEE) Publication P1547 (available at www.ieeeusa.org).
- If your project plans for the pre-commercial demonstration of a generating system, pre-installation system testing by the manufacturer or system integrator must be one of the tasks.
- A Technology Transfer Plan is required. The objective of the plan is to make the knowledge gained, experimental results, and lessons learned readily available to decision-makers. The plan must explain how the products from the other tasks will be distributed and how it will be made available to the public. The level of detail expected is least for research-related projects and highest for demonstration projects.
- A Production Readiness Plan is required. Projects are anticipated to lead to the mass manufacturing of developed hardware within the next five years and should include a task addressing production readiness. The Production Readiness Plan must consider the following:
 - a. Identification of critical production processes, equipment, facilities, deployment, personnel resources, and support systems that will be needed to produce a commercially viable product.
 - b. Internal manufacturing facilities, as well as supplier technologies, capacity constraints imposed by the design under consideration, identification of design critical elements and the use of hazardous or non-recyclable materials. The product manufacturing effort may include “proof of production processes.”
 - c. A projected “should cost” for the product when in production.
 - d. The expected investment threshold to launch the commercial product.
 - e. An implementation plan to ramp up to full production.

The degree of detail in the Production Readiness Plan discussion must be proportional to the complexity of producing the proposed product and its state of development. Applicants who wish to use PIER funds to optimize more complex production manufacturing processes, or have manufacturing processes closer to being market ready, will be expected to provide a higher degree of detail on the manufacturing process than Applicants whose manufacturing process is relatively simple or relatively far from being market ready.

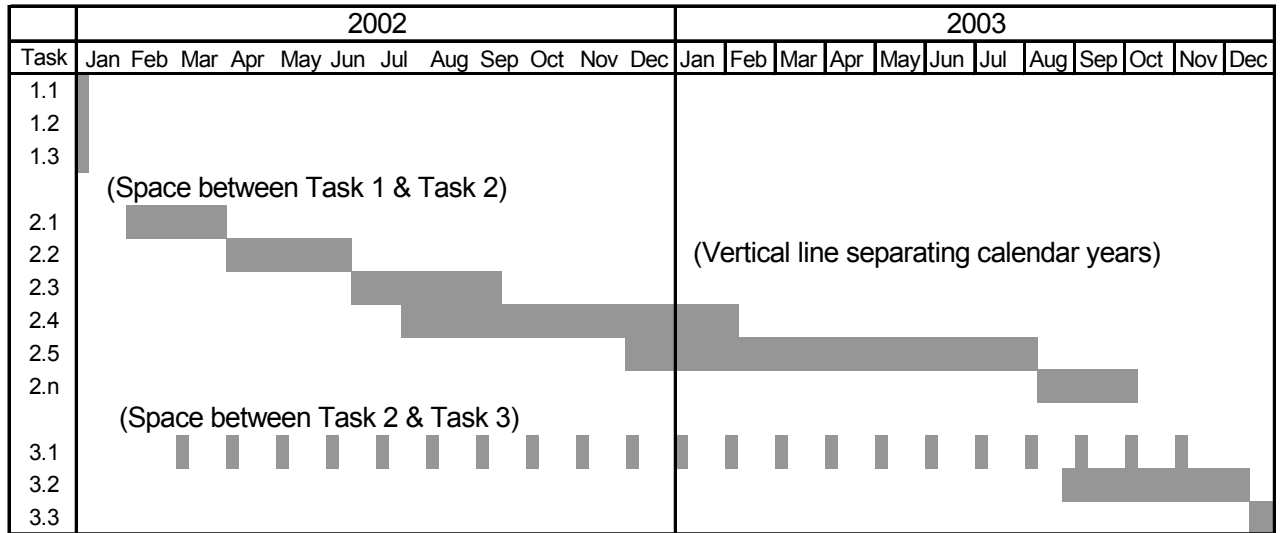
Products, Due Dates and Gantt Chart

Complete Application Manual Attachment A-6, Products, Due Dates and Gantt Chart. This attachment contains two spreadsheets: 1) Products and 2) a Gantt chart. Enter all of your task numbers first then enter task names. Entering information in this manner will properly link the spreadsheets. Next, enter the products in the order they appear in the Application Manual Attachment A-5, Work Statement, using the list of products from each task. Use one line for each product. Note that the spreadsheet contains Critical Project Reviews (CPR) shown as examples in two tasks. Put the CPRs where they belong in your project. Products that will be discussed at the CPR should appear before the review and their final versions should appear after. Plan for a minimum of one CPR a year.

The second spreadsheet contains a Gantt Chart, showing the overall summary of the project schedule. The purpose of the Gantt chart is to visually display the time frames of the tasks in this project. Each chart shall contain the following common characteristics:

- The task numbers in the first column should be transferred automatically to the Gantt Chart.
- Maintain blank rows between Task 1, Task 2 and Task 3.
- Modify the years to meet the time frame for your project. The template contains the maximum of 4 years. Separate each calendar year with a vertical line.
- The months are set up in 1/4-month increments so that your schedule can be accurate to the nearest week.
- Select the beginning month and year based on the expected start date for your project given the schedule for this Solicitation. Select the end-date based on the schedule for your project
- Task 1 contains administrative tasks required by the Energy Commission. Tasks identified under Task 1 should not be modified. You may add or delete rows as needed starting with Task 2.
- Shade the areas representing the time frame for each task. The shading has been preset at gray 40%.
- The chart has been preset to print as a single landscape sheet.

An example Gantt Chart:



Note: It does not matter whether the Gantt Chart is created in Microsoft Excel or Microsoft Project. However, it must fit on one 8 1/2 x 11 page.

Section 7. Project Costs

Complete Application Manual Attachment A-7 for both Task Budget and Category Budget.

In a narrative but quantitative and definitive manner, discuss:

- The appropriateness of the total project cost considering the scope of work and the relevant expertise of the Project Team.
- The appropriateness of the amount of PIER funding requested for the project considering the anticipated absolute and proportional public benefits to California electric ratepayers.
- The amount of match funding that will be brought to this project. Discuss the appropriateness of the level of match funding considering the estimated and anticipated level of private benefits. Describe the nature of the match funding being offered by the Applicant and subcontractors.
- Why PIER funding for the project is required—that is, why this project cannot be funded within competitive or regulated markets. Potentially valid reasons for PIER funding include high risk/reward concerns, high financial cost, or the non-exclusive nature of the project results, which would result in financial gain for others rather than for the Applicant. Defend your reason.

Projects that have results are more likely to lead to products and services that can be commercialized in the near future will generally need a higher percentage of matching funds than projects whose results are further removed in time from commercialization.

Describe any extra value that the Applicant provides. For example, concisely explain how previous and current work by the Applicant, patents and patent applications, proprietary information, databases, unique facilities, specialized equipment, or specialized expertise will be leveraged into the proposed work.

Acceptable and Non-Acceptable Sources of Match Funding

Discuss the sources of match funding CONTRIBUTED FOR USE IN THE ENERGY COMMISSION'S PROJECT. For example, Applicant and/or team members, project partners, investors, lenders, equipment manufacturers, utilities, universities, government entities or others. Discuss whether match funding is in cash or in-kind services. In-kind contributions include donated labor hours, equipment or facilities.

Staff time, laboratory space, equipment, and most property can count as match funds if they are fully dedicated to the project for the time the property or equipment is required by the agreement, and if the value of the contribution is based on documented market values or book values and is depreciated or amortized over the term of the project using generally accepted accounting practices.

Property and equipment that do not qualify as match funds include such items as standard office supplies and property or equipment that is part of the Applicant's normal business activity (desks, typewriters, telephones, computers, software, etc.).

All match fund expenditures must occur within the grant term. In all cases, the Energy Commission reserves the right to review and approve or disapprove the crediting of contributions and the amounts of those contributions as match funding.

Prior investments in the project do not qualify as match funds. Funding from other Energy Commission projects, grants or contracts does not qualify as match funding. The sources and amounts of match funding must be identified in the Applicant's budget.

Proposed match funding must be spent concurrently with PIER Program funds, and only on the project elements described in the proposal. Match funds can be spent once the Energy Commission has approved an awarded grant at a scheduled Business Meeting. However, PIER funds cannot be spent until the grant agreement is fully executed.

Permit List

Applicants are responsible for complying with permit requirements and any CEQA related filings for completion of the demonstration project. Costs incurred are not reimbursable under the PIER grant funds but may be listed as match funding by Applicant. Attachment A-8 is provided for listing of any or all existing or anticipated permits.

B5. What can I put in Volume 3 – Confidential Information and Pre-existing Intellectual Property?

Applicants are discouraged from submitting any confidential information regarding their proposed project under this Solicitation. However, if the Applicant believes that certain confidential information would be important for the scoring committee to consider, or would clarify the status of the development of the technology prior to any awarded grant (i.e., benchmarking for royalty purposes), Applicants may submit such specifically requested and identified confidential information as a *separate volume* to the Energy Commission. Include at the beginning of this volume the Confidential Products and Pre-existing Intellectual Property form, Solicitation Attachment A-9.

The Confidential Volume 3 must be packaged and sealed separately from the non-confidential Volumes 1 and 2. Volume 3 must accompany Volumes 1 and 2, must be clearly marked “Confidential Information for Targeted Wind Solicitation for Expanded Wind Regime Turbine Technology and Intermittency Management Demonstration”, and must include the Applicant’s name and the project title. The Energy Commission in accordance with the confidentiality regulations contained in Title 20, California Code of Regulations, Sections 2501-2505, will determine confidentiality.

The Energy Commission will not accept or retain any proposals that are submitted entirely in confidence. However, all proposals will be kept confidential until the Notice of Proposed Awards is posted.

B6. What Types of Information Are Considered Confidential?

Consistent with the Energy Commission’s confidentiality regulations (20 CCR 2501 et. seq.) and the California Public Records Act (Government Code Section 6250 et. seq.), the Energy Commission generally will grant confidential treatment for information that is essential to understanding the proposal, clarifies the status of technology prior to project work, or will be a product. Examples include:

- Any information that is patent pending (until a patent has been approved), including patent application numbers
- Technical trade secrets (e.g., detailed technical drawings)
- Marketing/business trade secrets (e.g., energy use data for an individual commercial or industrial facility, pending strategic partnerships with manufacturers)
- Economic/financial trade secrets (e.g., income tax records).

Conversely, the Energy Commission generally will not allow confidential treatment for certain other types of information. Applicants are cautioned against seeking confidentiality for the following types of information:

- Project descriptions/work statements (including task descriptions, schedule of products and due dates)
- Proposed project budgets (PIER and match fund), including labor rates
- Names of employees, subcontractors and match fund participants
- Test plans and reports

- Progress reports
- Final reports.

The Energy Commission will allow technical and business trade secrets to be reported in separate confidential addenda to test reports and final reports.

B7. How is Confidential Information Treated?

From the beginning of the Solicitation process until the evaluation is complete and the Notice of Proposed awards is posted, the Energy Commission is required to hold all information received from Applicants as confidential. However, proposals and all submittals will become public record after the Energy Commission completes the evaluation and/or scoring process and the Notice of Proposed Awards is posted.

After the posting of awards,

- Confidential materials submitted by unsuccessful Applicants will be destroyed and/or returned. The Energy Commission will not retain confidential submittals from unsuccessful Applicants.
- Confidential materials submitted by successful Applicants will be kept confidential, pending incorporation of confidentiality determination as part of the subsequent PIER grant as appropriate.

A complete application for confidentiality pursuant to Title 20, California Code of Regulations, sections 2505(a) and 2505(c)(2)(A) may be required prior to Energy Commission approval of the grant. These confidentiality specifications and procedures are issued in accordance with Title 20, California Code of Regulations, section 2505(c)(2)(A).

C. Questions Related to Evaluation Process and Scoring Criteria

This section explains the overall evaluation process and the technical and policy evaluation criteria. It describes how the proposals will be evaluated for completeness, eligibility and fundamental scientific feasibility. It also describes the evaluation stages, and scoring of all proposals.

The entire evaluation process from receipt of proposals to the posting of the Notice of Proposed Award is confidential.

An Applicant's proposal will be evaluated and scored based on its response to the information requested in this Solicitation. During the evaluation and selection process, the Energy Commission may interview Applicants either by telephone or in person at the Energy Commission, and/or conduct a site visit at the Applicant's facilities for the purpose of clarification and verification of information provided in the proposal. However, these interviews may not be used to change or add to the contents of the original proposal.

C1. What is the Proposal Screening Process?

Administrative, Completeness, Eligibility, and Feasibility Screening

All proposals will be initially screened for administrative, completeness, eligibility, and fundamental scientific feasibility. Proposals that fail the administrative, completeness, eligibility, and feasibility screening will not be evaluated further under this Solicitation.

1. Administrative Screening

If your proposal fails any of these items, it will be rejected immediately:

- The proposal must not exceed the specified allotment for a single project (\$1.75 million) as described in Section III. Any proposal requesting more than the \$1.75 million will be rejected and not evaluated further.
- The proposal must be for a low speed wind turbine system development and demonstration project in state and have an intermittency management capability that relies upon commercially available generation systems that is in compliance with all California state regulations and permits for operation. Any proposal requesting funds to research and develop new hybrid generation systems will be rejected and not evaluated.
- The proposal must clearly identify a low speed wind resource area that satisfies programmatic factors as identified in Section III – Scope of Project and that will benefit from the development of low speed wind resources. Additionally the proposal must quantify benefits to state's electricity ratepayers as result of the work performed.

- The original proposal plus 10 bound copies and electronic files on CD-ROM must be received at the Energy Commission Grants and Loans Office by the time and date indicated in Section III. Late proposals will be rejected.
- The proposal must not be marked confidential in its entirety. Proposals that are marked confidential in their entirety will be rejected from further evaluation under this Solicitation.

2. Completeness Screening

A proposal must include the contents described in Section III B, Application Manual Attachments and Forms or the proposal will fail the completeness screening and will be rejected prior to the technical evaluations. In particular, proposals will be screened for completeness on the basis of whether or not the proposal contains sufficient information to enable a useful evaluation to be conducted.

3. Eligibility Screening

To be eligible for possible funding under this Solicitation, proposed projects must meet all of the following eligibility criteria:

- The project must address all of the goals identified in Table 1 of Section III.
- The project team must have a demonstrated track record for developing and demonstration of wind energy systems or comparable complex systems and bringing the product to the marketplace.
- The project must contain a discussion that clearly identifies how the proposed low speed wind turbine demonstration and IMC based RD&D activities will advance wind generated technologies and penetration into the electricity market.
- Each proposal must be limited to a single, specific project. Individual proposals that request funding for multiple projects are not eligible for this Solicitation, and will be rejected from further evaluation. The Energy Commission has full discretion to determine whether a proposal is for a “project” (and therefore eligible for this Solicitation) or a “program” (and therefore not eligible for this Solicitation). An Applicant may submit separate proposals for different projects.
- Pertaining to the completion of the project, the Applicant must not be a party to any claim or lawsuit alleging breach of contract, misrepresentation, and/or frauds, liens or judgments that clearly jeopardize completion of the project.

4. Feasibility Screening

Proposals will be evaluated for fundamental feasibility on the basis of whether the proposed project appears to comply with sound scientific principles, technical and market viability and commercialization potential and feasibility and if not, whether the proposal contains a sufficiently sound explanation to justify proceeding with a further evaluation.

C2. How will Proposals be scored?

Overview of the Evaluation Scoring Process

All proposals that pass the Completeness, Eligibility and Feasibility Screening will be further evaluated and scored for merit. The Energy Commission may use Energy Commission staff, staff of other agencies, private consultants or other designated representatives of the State to evaluate the proposals. All proposal evaluators and scorers will keep the contents of the proposals confidential. The technical, financial and policy merits of each proposal will be evaluated.

An Energy Commission Scoring Committee will evaluate and score proposals according to the evaluation criteria below. Eligible proposals will be ranked in descending order based upon total score. All proposals receiving a weighted score of one hundred five (105) points or more out of a maximum 150 total points will be considered for possible funding. The Energy Commission's RD&D Policy Committee will recommend how far down the ranked list of proposals scoring one hundred five (105) points or higher will receive awards. The Committee's recommendations are presented at an Energy Commission Business Meeting and can be approved as recommended, or the Energy Commission can adjust the cut-off lines higher or lower in the ranking.

Projects above the Energy Commission's adopted cut-off line cannot be "skipped-over" for funding. That is, a project with a higher score cannot be rejected while a project with a lower score is funded. Projects that fall below the Energy Commission's adopted cut-off line will not be funded at this time.

If a successful Applicant decides to withdraw a proposal, or if Applicant will not sign a proposed agreement within the allotted time, the project can be disqualified from this award and the next highest-ranked project may be funded instead.

The Scoring Committee will give a score from zero to ten for each criterion described below, based upon the information provided by the Applicant's proposal. Each score will then be multiplied by a weighting factor to obtain the total points for that criterion. The scoring form is provided as Exhibit E-2.

Scores will be assigned in accordance with the following guidelines:

Score	Proposal Response
0	Failing Response
1 to 3	Below Average Response
4 to 6	Marginal Response
7	Average/Acceptable Response – Meets relevant considerations, satisfactory
8 to 9	Above Average Response – Meets relevant considerations, convincing
10	Exceptional Response – Complete, specific and superior, both quantitatively and qualitatively

C3. What are the Technical, Financial and Policy Evaluation Criteria?

All proposals that pass the Completeness, Eligibility and Feasibility screening will be evaluated for merit based on the following technical, financial and policy evaluation criteria. Proposals must satisfactorily respond to these criteria in order to receive the minimum passing score of 105 points (70% passing).

CRITERION	WEIGHTING	MAXIMUM POSSIBLE SCORE
1. Soundness of Technical Approach and Scientific Baseline	2.0	20
2. Reliability: Improvement in reliability/quality and diversity of California's Electricity	1.0	10
3. Affordability: Improves Energy Cost/Value of California's Electricity	1.0	10
4. Relevance to Solicitation's Targets and Stretch Goals	1.5	15
5. Likelihood of Success and Market Connection	1.5	15
6. Economic Benefits: Successful completion of the proposed project will directly impact local and state economies and state ratepayers	1.5	15
7. Cost Effectiveness of the Project	1.5	15
8. Match Contribution	2.0	20
9. Skills, Knowledge and Experience of Team	2.0	20
10. Other significant factors that increase the project's merit	1.0	10

Evaluation Criteria Details

1. Soundness of Technical Approach and Scientific Baseline:

Weighting Factor: 2.0 Possible Points: 20

Proposal should address the extent to which the project will develop sound products, services and/or knowledge that improves the reliability, affordability, diversity and safety of electricity for California ratepayers by:

- Increasing wind generation penetration into the electricity market to meet RPS goals and to promote commercialization of cost-effective low speed wind turbine systems and IMC.
- Articulating the “big-picture” approach for the project and demonstrate a low speed wind turbine systems capable of operating reliably and cost-effectively in a Class 3-4 wind regime (10m) in California. Present “timeline” for full project development to commercialization.

- Integrating the most appropriate IMC strategy to firm up wind and tailored for the region of application. Tradeoffs and considerations must be presented and discussed as well as industry partners and potential partners identified and engaged.
- Aligning low speed wind resource generation benefits with a location and service territory needs.
- Leveraging lessons learned from past industry projects/experiences and how current approach differs especially if alternative approaches have failed. The Applicant describes in detail, with substantiation, its past and current work in the subject technology and advances from baseline. Accomplishments (not just activities), successes and failures are described.
- Describing technical and economic feasibility studies including barriers, issues and identification and securing of necessary permits and environmental reviews.
- Describing the methodology and performance metrics used to determine the success of the project in achieving objectives and goals. Note quantified metrics to measure the success at the conclusion of the project must be included.
- Justifying how and why the proposed project is the necessary, next RD&D step for the industry. Results in a series of interconnected, logical, and discrete tasks within the project's proposed Work Statement.
- Clearly articulating any distinctive and innovative features of the approach.
- Demonstrating high probability of project success with a succinct Work Statement (Application Manual Attachment A-5), quality products, reasonable milestones and schedule, qualified team and other project details. Note: Projects should include tasks to complete a Test Plan, a Technology Transfer Plan, and a Production Readiness Plan as described in the Application Manual.
- Providing necessary proprietary information (if available) to complete the project is described, along with a plan for obtaining this information. Describe plans for resolving intellectual property concerns, if applicable.

2. Reliability – Improvement in Reliability, Quality and Diversity of California's Electricity:

Weighting Factor: 1.0 Possible Points: 10

Proposal should address the extent to which the project will develop products, services and/or knowledge that improves the reliability and safety of electricity for California ratepayers through:

- Improving the dispatchability of intermittent wind electricity generation by incorporating IMC strategies which maximize the value of wind resources to utilities.
- Increasing the physical reliability and security of generation by diversifying the generation portfolio for the state.
- Helping to achieve RPS goals and PIER RD&D programmatic targets with a complete wind generation package that offers performance in various wind regimes and manages intermittency risks.
- Collecting performance data and load information on a demonstration unit to close technology gaps relevant to low speed wind operation and to satisfy commercial certification and deployment needs.

3. Affordability – Improves Energy Cost/Value of California’s Electricity:

Weighting Factor: 1.0 Possible Points: 10

Proposal should address the extent to which the proposed project will lead to new product development, services and/or knowledge that improves the value of wind generated electricity and affordability of electricity for California ratepayers:

- Demonstrating a cost-effective complete wind turbine generation package by providing low speed wind generation technology coupled with commercially available systems as an IMC. (compare to current base case onshore wind technology = \$0.05/kWh without a Production Tax Credit - PTC)
- Improving efficiency for the complete wind turbine generation package.
- Increasing operating flexibility and confidence that can lead to higher wind penetration and improved energy value (i.e., for RPS bid process).
- Reducing operation and maintenance costs.

4. Relevance to Solicitation’s Targets and Stretch Goals:

Weighting Factor: 1.5 Possible Points: 15

Proposal should address the extent to which the proposed project will develop products, services and/or knowledge that meets or exceeds the targets and stretch goals by:

- Clearly identifying and explaining the quantitative or measurable technical performance goals and objectives relevant to targets in Section III, Table 1 achievable by the project.
- Showing expected values for key performance parameters for the proposed generating system and for a commercial product to meet market needs. Tradeoffs among the performance parameters are clearly discussed.
- Identifying and describes clear, significant, and quantifiable technical and economic objectives to support RPS and PIER RD&D goals.
- Describing the methodology and performance metrics used to determine the success of the project in achieving objectives and goals.

5. Likelihood of Success and Market Connection:

Weighting Factor: 1.5 Possible Points: 15

The likelihood, timing and economic value of successful market transfer of products, market utilization, services and/or knowledge resulting from the project and the extent to which the proposed project has made provisions to facilitate market transfer. Evaluations using this criterion will consider, for example:

- The probability that the project will lead to commercialized or otherwise useful products and/or services in the short-term (1-5 year), medium-term (6-10 year), and/or long-term (11+ year).
- The subsequent steps, and the approximate cost that must be taken to lead to a commercial product are discussed.
- The dollar value of these products and services, should successful commercialization or other uses occur.

- Whether specific hurdles to commercialization or other uses are addressed, such as manufacturing technology/cost, involvement of regulatory entities for projects focused on environmental benefits, participation of related companies/industries when the project addresses a component of a larger system, etc.
- The probability that science and/or knowledge resulting from the project will reach and address the needs of appropriate scientific, policy-making, industry and other communities; and the value of the science and/or knowledge to these communities.
- The likely extent of environmental impact and/or improvements (e.g., avian, community aesthetics, terrestrial animal habitat).

6. Economic Benefits – Successful Completion of the Proposed Project will Directly Impact Local and State Economies and State Ratepayers:

Weighting Factor: 1.5 Possible Points: 15

The extent to which the proposed project will result in products, services, and/or knowledge with direct economic benefits to California's economies and ratepayers by: 1) increased employment; 2) increased quality of jobs; 3) increased tax revenues or new market benefits; 4) other factor that directly increases California's gross state product. Evaluations using this criterion will consider, for example:

- Probability that the project will lead to commercialized or otherwise useful products and services in the short-term (1-5 years), medium-term (6-10 years), and long-term (over 11 years).
- Estimates (quantified metrics) for gauging the success of the project related back to the critical issues being addressed.
- Savings from the deferment of costly T&D upgrade and new construction due to locating a low speed wind facility utilizing low speed wind systems and IMC.
- The number and quality of jobs inside California that will be created should successful commercialization occur.
- Tax revenue, in-state jobs or other benefits resulting from the science and/or knowledge resulting from the project.
- Expected stakeholders (users, market segments) and communities that will benefit from the expected outcomes.
- Description of the potential market size as well as any significant market outside California.
- Related benefits such as reduced environmental emissions and costs, reduced odors, manufacturing costs, improved fuel conversion efficiency, greater reliability and durability are discussed and quantified, and related to the project objectives and goals.

7. Cost Effectiveness of the Project:

Weighting Factor: 1.5 Possible Points: 15

The cost of the proposed project will be evaluated relative to the overall public benefits being provided by the project. Evaluation criteria will consider:

- Total cost of the project.

- The amount of PIER funds requested.
- The likelihood that the project will provide significant science or technology benefits.
- The proposal demonstrates that the total project cost is appropriate, considering: 1) the significance of the barriers being addressed, 2) the project's objectives and goals, and 3) the level of effort described in the Work Statement.
- The estimated value of the public benefits to be provided by the project.
- The extra value Applicant brings based on prior projects.

8. Match Contribution:

Weighting Factor: 2.0 Possible Points: 20

The appropriateness of the proposed project and level of match funds will be evaluated based on:

- The types, amount and sources of match funds identified in the proposal.
- The amount of public (versus private) benefits that will result from the project.
- The security of the proposed match funds.
- The type of match funding proposed (e.g., cash versus in-kind contributions).
- Satisfying the minimum 50% match fund contribution (20% of 50% must come from private sources) as specified in Section III A.
- Project budget information provided is consistent with the work statement and itemized costs for personnel, subcontractors, materials, operating and total expenditures for each task are reasonable.
- The percentage of matching funds should be proportional to the amount of private versus public benefits that are likely to result from the project: 1) Projects providing more private benefits versus public benefits should have a higher % of match funds than projects that provide more public benefits; 2) Percentage of match funds should be greater for innovations that are closer to market adoption; 3) Projects likely to lead to commercialized products and services within a short time frame should have higher % of match funds than projects whose results are further in time from commercialization.
- Note: A financial review of the Applicant based on information will be conducted as part of the review process to assess the ability of the Applicant to successfully provide match funds and conduct the project.

9. Skills, Knowledge and Experience of Team:

Weighting Factor: 2.0 Possible Points: 20

The proposal should indicate the extent to which:

- The qualifications (resume list) of the Project Director and the Project Members (Team) to successfully conduct the project and overcome obstacles.
- The team has sufficient experience and a demonstrated track record for bringing large complex systems to commercialization via project development, manufactured engineering improvements and market connectedness.
- The team has demonstrated its capability to perform the project's scientific and engineering (technical) tasks.

- The team is capable of administering the grant agreement to control costs, maintain the project schedule, help develop the technology and communicate status with the funding agency.
- The team has the relations, financial skills and capability to ensure market connection of the technology.
- The team has adequate resources and flexibility to overcome resource, personnel changes and knowledge shortfalls.

10. Other Significant Factors that Increase the Project's Merit:

Weighting Factor: 1.0 Possible Bonus Points: 10

Other significant factors that increase a project's merit will be considered by the proposal evaluation team. The following are examples:

- The Applicant already has access to a California low speed wind site for demonstration of proposed turbine technology.
- The proposal clearly shows that the Applicant (approach, resources, innovative and unique technology for low speed wind turbine and commercially available IMC) has the potential to successfully reach commercialization in the near-term (1-3 year). The extent to which any patent lawsuits or claims jeopardize completion of the grant agreement should be identified.
- The proposal addresses key problems and focus areas consistent with the goals and objectives stated in the CEC Energy Action Plan (available on the CEC website www.energy.ca.gov)
- The Applicant's performance on previous Energy Commission agreements has been superior (e.g., goals and objectives either were achieved or the Applicant documented significant lessons learned, and the Applicant responded to Energy Commission direction. Products/products were complete and submitted on time and within budget).
- Team is uniquely qualified and demonstrates financial capability to successfully complete the project.
- The proposed project is well-integrated with, and complementary to, other low wind speed turbine and intermittency technology RD&D efforts, such as those being funded by the U.S. Department of Energy, other federal government agencies, agencies from other states, and others (please specify).

Summary of all evaluation scores

- Total possible points: 150
- Minimum passing score: 105 (70%)

D. Questions Related to Submission of Applications and Administrative Information

This section provides Applicants with information on submitting a successful proposal, definitions of important terms, sources of information, how to submit a proposal, grounds for rejecting a proposal, and other administrative details. Every technical proposal must establish in writing the Applicant's ability to perform the tasks listed in the Work Statement.

D1. Is There a Deadline for Submitting a Proposal to this Solicitation?

All copies of your proposal must be delivered to the Energy Commission's Grants and Loan Office during normal business hours and prior to the date and time specified in Section III. Proposals received after the specified date and time are considered late and will not be accepted. There are no exceptions.

D2. How Should a Proposal be Packaged and Labeled for Submittal?

Applicants must submit the required number of copies of each volume, including if necessary, the Confidential Information. The original and copies of each volume must be in a separate, sealed envelope, labeled with the following information, depending upon the contents of the envelope:

- "Volume 1 – Administrative Section"
- "Volume 2 – Technical and Cost Sections"
- "Volume 3 – Confidential Information"

All envelopes must further be labeled "PIER Targeted Wind Solicitation for Expanded Wind Regime Turbine Technology and Intermittency Management Demonstration" and include the title of the proposal.

D3. Is There a Preferred Method for Delivery of the Proposal?

Applicant may deliver a proposal by:

- U. S. Mail
- Personally
- Courier service

Postmark dates of mailing, electronic mail and facsimile (FAX) transmissions are not acceptable in whole or in part under any circumstances.

D4. What is the Address for Delivery of Proposals?

Label and deliver your proposal, in a sealed package, as follows:

Person's Name, Phone #
Applicant's Name
Street Address
City, State, Zip Code
FAX #

**Wind Target Solicitation for Expanded Wind Regime
Technology and IMC Demonstration**

Grants and Loan Office
California Energy Commission
1516 Ninth Street, MS-1
Sacramento, CA 95814

D5. Can I be Reimbursed for the Cost of Preparing this Application?

No. The Applicant is responsible for the cost of developing a proposal, and this cost cannot be charged to the State or the Energy Commission.

D6. Can the Energy Commission Impose Conditions or Limits on Awards?

Yes. The Energy Commission reserves the right to condition, modify or otherwise limit any and all PIER funding awards made pursuant to this Solicitation so as to avoid unnecessary duplication or overlap of efforts within a proposal or between proposals receiving PIER funding.

D7. Can the Energy Commission Cancel or Amend This Solicitation?

Yes, if it is in the State's best interest. The Energy Commission reserves the right to do any of the following:

- Cancel this Solicitation;
- Amend or revise this Solicitation as needed; or
- Reject any or all proposals received in response to this Solicitation.

D8. How will I know if the Solicitation is Revised?

If the Solicitation must be changed or revised, the Energy Commission will prepare and mail a formal written addendum to all parties who requested a copy of the Solicitation from the Energy Commission. In addition, the addendum will be posted on the Energy Commission's Web Site: www.energy.ca.gov/research. The Solicitation cannot be revised after the proposal due date.

D9. What If I Find an Error in this Solicitation Document?

If Applicant discovers any ambiguity, conflict, discrepancy, omission, or other error in the Solicitation, the Applicant shall immediately notify the Energy Commission of such error in writing and request modification or clarification of the document. Clarifications will be given by written notice of all parties who have obtained a Solicitation, without divulging the source of the request for clarification. The Energy Commission shall not be responsible for failure to correct errors.

D10. Generally, What are the Grants Requirements?

Term of the Grant Agreement

The estimated term of the grant award will be from December 2004 to December 2008. Typically, the duration of a project is shorter than the term of the agreement. It is anticipated that projects under this Solicitation will span a two to four year period.

PIER Grants -Terms and Conditions

Standard PIER Grants Terms and Conditions are included in this Solicitation (Exhibit E-1, Terms and Conditions). It is the intention of the Energy Commission to use these Standard Terms and Conditions in all agreements awarded as a result of this Solicitation. Applicants who are awarded grants should review the terms and conditions prior to signing the grant agreement. The Energy Commission reserves the right to modify the terms and conditions anytime prior to executing the grant award. The content of this Solicitation and the Applicant's proposal will be incorporated by reference into the final agreement.

Grant Agreement Cancellation

The Energy Commission reserves the right to terminate any grant through this Solicitation by providing a 30-day notice to the successful Applicant.

No Grant Award Until Signed and Approved

The proposed grant between the Energy Commission and the successful Applicant is not in effect until the grant agreement is signed by all of the parties, which includes approval at an Energy Commission Business Meeting, Applicant signature, and Energy Commission signature.

Grant Amendment

A grant agreement executed as a result of this Solicitation can be amended by mutual consent of the Energy Commission and the Recipient. The grant may require amendment as a result of project review, changes and additions, changes in project scope, or availability of funding.

Audit

The PIER Audit Program, Bureau of State Audits, or other appropriate State agency may audit a grant awarded under this Solicitation up to a period of three years after the final payment or termination of the grant.

Subcontractors

Any subcontractor the Applicant chooses to use in fulfilling the requirements of this Solicitation that is expected to receive more than ten percent (10%) of the value of the agreement, must also meet all administrative and technical requirements of this Solicitation. The Applicant must provide a summary of each subcontractor's qualifications, including experience and duties that would be performed under the Work Statement.

The Recipient is responsible for the quality of all subcontractor work, and may only replace subcontractors as specified under the Grant Terms and Conditions.

Universities

Separate terms and conditions have been negotiated with the University of California. A University of California Recipient can use these Energy Commission-approved terms. These terms and conditions are available by contacting the Energy Commission Grants and Loan Officer at (916) 654-4381.

Department of Energy (DOE) Laboratories

Separate terms and conditions have been negotiated with DOE Labs. DOE Labs can use these Energy Commission-approved terms. These terms and conditions are available by contacting the Energy Commission Grants and Loan Officer at (916) 654-4381.

D11. What If I Decide To Modify Or Withdraw My Proposal?

Withdrawal/Modification

Applicant may, by letter to the Grants and Loan Officer, withdraw or modify a submitted proposal before the proposal deadline (due date and time) in the schedule. Proposals cannot be changed after that date and time.

Immaterial Defect

The Energy Commission may waive any immaterial defect or deviation contained in an Applicant's proposal. The Energy Commission's waiver shall in no way modify the proposal or excuse the successful Applicant from full compliance.

D12. How Will I Know if I Have Been Awarded A Grant?

A Notice of Proposed Awards (NOPA) will be posted for five (5) working days at the Energy Commission's headquarters in Sacramento, and on the Energy Commission's web site. In addition, each Applicant will be mailed a copy of the NOPA.

D13. What is the Grant Agreement Process?

The grant process is:

- 1) Post NOPA
- 2) Receive approval at Energy Commission Business Meeting
- 3) Develop Grant Agreement and Execute

Grant documents will be prepared and sent to successful Applicants for their signatures. The Energy Commission will not consider any substantive changes to the grant "terms and conditions" contained in this Solicitation. If, for any reason, a successful Applicant does not respond by signing the grant agreement documents within a reasonable time (30 days after mailing), the Energy Commission may eliminate that project from its award list and select the next highest ranked project for funding.

D14. What are the Grounds for Rejection?

Refer to the screening criteria provided in Section III. C. "What is the Proposal Screening Process."

D15. What Happens If My Proposal Is Unsuccessful?

After the NOPA is posted, each unsuccessful Applicant may request a debriefing meeting with the Energy Commission. The debriefing meeting is an opportunity for an unsuccessful Applicant to learn why their particular proposal was not successful and may provide insight to improving proposal preparation for future Solicitations.

D16. What Happens To My Proposal Documents?

On the Notice of Proposed Award date, all proposals and related material submitted in response to this Solicitation become the property of the State and a part of the public record, unless the Applicant has submitted an application for confidentiality.

Confidential documents submitted by unsuccessful Applicants will be returned to the Applicant or destroyed by the Energy Commission. Applicant identified and Energy Commission designated confidential documents will be filed separately from the rest of the proposal and grant documents. Only authorized persons will have access to these designated confidential documents.

IV. Key Words and Their Definitions

KEY WORDS	DEFINITIONS
Applicant	Offeror of proposed RD&D project
Availability	A measure of time a generating unit, transmission line, or other facility is capable of providing service, whether or not it actually is in service. Typically, this measure is expressed as a percent available for the period under consideration. (Ref.: Glossary of Terms Task Force, North American Electric Reliability Council, http://www.nerc.com/glossary/glossary-body.html)
Baseline Condition	The current, state-of-the-art technology or body of knowledge for a particular topic.
CEQA	California Environmental Quality Act http://ceres.ca.gov/topic/env_law/ceqa/guidelines/
Energy Commission	California Energy Commission.
COE	Cost of electricity (\$/kWh)
CPR	Critical Project Review meeting held at the Energy Commission to review progress and status of project
Grant	The agreement signed by the Applicant and the Energy Commission and approved at Energy Commission Business Meeting.
Grant Budget	The proposed Energy Commission-reimbursable expenditures AND the Applicant's match fund expenditures for that portion of the project covered by the agreement term.
Grant Term	The start and end dates stated in the agreement between the Energy Commission and the Recipient. The project may be shorter than, coincide with, or extend beyond, the grant term. However, all Energy Commission reimbursed and match share funded activities must occur during the agreement term.
Decision Maker	An individual or organization that can use the results of a completed project for further RD&D, technology commercialization, or use.
Demonstration	Operation of a completed product embodying a prototype or commercial configuration of a technology for the purpose of demonstrating the attainment of project goals.
Development	Bringing into reality or activity a product embodying a commercial configuration of a technology.
Dispatchability	Generation available physically or contractually to respond to changes in system demand or to respond to transmission security constraints. (Ref.: Glossary of Terms Task Force, North American Electric Reliability Council, http://www.nerc.com/glossary/glossary-body.html)

Distributed Generation (DG), also referred to as Distributed Energy Resources (DER)	An Energy Commission Committee has defined DG as stationary applications of electric generating technologies that are smaller than 50 MW of net generating capacity, the Energy Commission's power plant siting jurisdiction threshold. These generating installations may be owned by electric or gas utilities; industrial, commercial, institutional or residential energy consumers; or independent energy producers. They include generating technologies such as engines, fuel cells, small and "micro" gas turbines, solar photovoltaics (PV), and wind turbines, and may be combined with electric storage technologies such as batteries and flywheels. (Ref: <i>Distributed Generation: CEQA Review and Permit Streamlining</i> , California Energy Commission Energy Facility Siting and Environmental Committee, report number P700-00-019, December 2000, page 10, available at http://www.energy.ca.gov/distgen/documents .) Other entities have defined DG in different ways. For example, the California Alliance for Distributed Energy Resources (CADER), Technology Characterization Committee, described DER technology characteristics as follows: "generates or stores electricity located near or at a load center, can be grid connected or isolated, has a value greater than grid power including customer value, distribution system benefits, backup or emergency power, and social or environmental value."
Economic Performance Objective	A degree of improvement in the capital cost, operating cost, or maintenance cost of a system expressed as an improved competitive position in the market.
End User	An entity that consumes energy, including electricity or thermal energy, or that directly generates and/or markets energy systems.
Equipment	An item or group of items having a useful life of at least one year and having an acquisition unit cost of at least \$5,000. <i>Equipment</i> means any products, objects, machinery, apparatus, implements or tools purchased, used or constructed within the project, including those products, objects, machinery, apparatus, implements or tools from which over thirty percent (30%) of the equipment is composed of materials purchased for the project.
FOB	Freight on board. When referring to cost, this is the cost of the item ready for shipping from the manufacturer.
Goal	For the purposes of this Solicitation, "goal" is defined as an improvement in technology or the state of knowledge that can be measured and quantified.
Innovation	Previously unknown, unused, or not broadly adopted combination of methods, materials, processes, or conditions.
Key Personnel	Those individuals who are critical to the successful completion of the proposed project and are difficult to replace because of their experience, capabilities and knowledge.

Key Subcontractors	Those contractors, subcontractors or vendors to the Recipient who are critical to the outcome of the project. As with Key Personnel, Key Subcontractors may have expertise in the particular field, or have experience that is not available from another source and replacement may significantly affect the project. An employee of the Recipient's subcontractor or vendor may also qualify as "key."
Market Connection	A key objective of the PIER program is to develop energy products or services that will be applied in the real world, and will thus produce benefits for California's electricity ratepayers. A strong connection with the market can be demonstrated by (1) identifying a specific market(s) for the products or services resulting from the RD&D efforts, (2) estimating the size of that market (and how much of that market exists in California), (3) providing an overview of the pathway(s) by which such products or services will ultimately enter the marketplace, and (4) identifying people and entities that can aid in facilitating market entry. Demonstration projects should be closely connected to the market, while fundamental research projects may have a less quantifiable market connection.
Milestone	A significant point in the performance of the project. Examples include the Critical Project Review, the completion of a task, the submittal of a product, the completed installation of a piece of hardware, and the initial operation of a new system.
Objective	For this Solicitation, "objective" is defined as a desired condition outside the project itself that results from the success of the project.
Performance Metric	An indicator of the performance of a product that allows the research product to be evaluated on its ability to meet the identified technical, economic and performance goals.
PON	Program Opportunity Notice
Private Benefit	For the purposes of this Solicitation, private benefit is an economic return or profits that the Applicant or a member of the team acquires for its own advantage.
Products	Products are deliverables that incorporate the knowledge and understanding gained by performing the activities and that are submitted to the Energy Commission for review, comment and approval.
Program	A collection of individual projects with the same set of overall goals and objectives, wherein each project develops a unique product or service to help achieve the overall program goals and objectives. Within a program, the individual projects are separate and their unique products or services can be developed independently (e.g., development of several different types of technology a coordinated effort to achieve lower costs and higher efficiencies). By simply obtaining information (as opposed to

	developing a product or service) does not constitute a program.
Project	An RD&D effort intended to advance a specific science and/or technology that is guided by a set of goals and objectives and that is implemented according to a valid technical approach.
Proposal	The formal written response to this Solicitation from the Applicant. If the proposal is accepted by the Energy Commission, the proposal will be included as part of the agreement.
PTC	Production Tax Credit
Public Benefit	A project produces public benefits if it achieves one or more of the following five objectives: (1) improves energy cost or value, (2) improves the environment, public health and safety, (3) improves energy reliability, quality or sufficiency, (4) strengthens the California economy, and (5) provides consumer choice. (Ref: <i>California Energy Commission Five-Year Investment Plan, 2002 Through 2006, for the Public Interest Energy Research (PIER) Program, Volume 1, Report to the California Legislature</i> , California Energy Commission, March 1, 2001. Available at http://www.energy.ca.gov/research/ .)
Recipient	Applicant, after a grant with Energy Commission has been signed and approved.
Reliability	The degree of performance of the elements of the bulk electric system that results in electricity being delivered to customers within accepted standards and in the amount desired. Reliability may be measured by the frequency, duration, and magnitude of adverse effects on the electric supply. Electric system reliability can be addressed by considering two basic and functional aspects of the electric system Adequacy and Security. Adequacy is the ability of the electric system to supply the aggregate electrical demand and energy requirements of the customers at all times, taking into account scheduled and reasonably expected unscheduled outages of system elements. Security is the ability of the electric system to withstand sudden disturbances such as electric short circuits or unanticipated loss of system elements. (Ref.: Glossary of Terms Task Force, North American Electric Reliability Council, http://www.nerc.com/glossary/glossary-body.html)
Research	The careful, systematic, and reasonably thorough study and investigation in a particular field of knowledge, for the purpose of discovering or establishing facts or principles and developing a product or process.
Serviceable Life	Minimum hours of operation within which cost-effective maintenance can be accomplished. When unit replacement is a less expensive option, serviceable life ends.
Solicitation	The PON and Application Manual, this entire document. The competitive process of selecting project(s) to be funded under this Solicitation.

Stakeholder	An entity, such as an individual, corporation, trade organization, end user, research organization, university, regulatory body, government agency, financial organization, sponsor, or marketer that has a title, financial share, special skill or resource, mandated responsibility, or other direct interest in the undertaking to develop, enable, negotiate, deploy, or commercialize a technology.
State	State of California.
Subject Technology	The body of knowledge, system component, device, generating system, manufacturing technique, material, etc. that will be improved as a result of the project proposed by the Applicant.
Task	A distinct research effort that includes an objective, a description of related activities, and a list of products. Within this Solicitation, the task is the lowest level of a research effort. Multiple tasks support a project.
Team Member	A stakeholder with contractual responsibilities to the Energy Commission (i.e., the Applicant), or to the Applicant (e.g., subcontractors, consultants, etc.), associated with a project. Such team members may include, but are not limited to, wind turbine system manufacturers, suppliers, vendors, universities, research organizations, a National Laboratory, technology owners, industry trade organizations, and end users.
Technical Performance Objective	A qualitative degree of improvement in the performance of a system, component, or subsystem.
Technological Baseline	The current state-of-the-art or the developmental status of the subject technology to be developed, or the body of knowledge to be advanced.
Technology	The general subject area where the product or innovation would be used.
Usability	An index indicating the ease of operation from the end-user perspective.

V. Application Manual Attachments and Forms and Exhibits

Volume 1 Administrative Information	
ATTACHMENT NUMBER	ATTACHMENT TITLE
A-1	Application and Project Information Form
A-2	Project Team List, Key Personnel, Key Subcontractors <ul style="list-style-type: none"> • Narrative Description of Skill and Experience • Resumes
A-3	Financial Information Form

Volume 2 Technical & Cost Information	
ATTACHMENT NUMBER	ATTACHMENT TITLE
A-4	Executive Summary Form
A-5	Work Statement
A-6	Products, Due Dates and Gantt Chart
A-7	1. Category Budget Information, Instructions and Forms 2. Task Budget Instructions and Forms
A-8	Permit List

Volume 3 Confidential Information & Pre-existing Intellectual Property (if applicable)	
ATTACHMENT NUMBER	ATTACHMENT TITLE
A-9	Confidential Products and Pre-Existing Intellectual Property List and Instructions

Exhibits	
NUMBER	TITLE
E-1	Grant Terms and Conditions
E-2	Technical Review Scoring Form
E-3	Summary of Allowable Travel and Per Diem Expenses